

THE GEOGRAPHICAL MAGAZINE

JANUARY 1946 1/3



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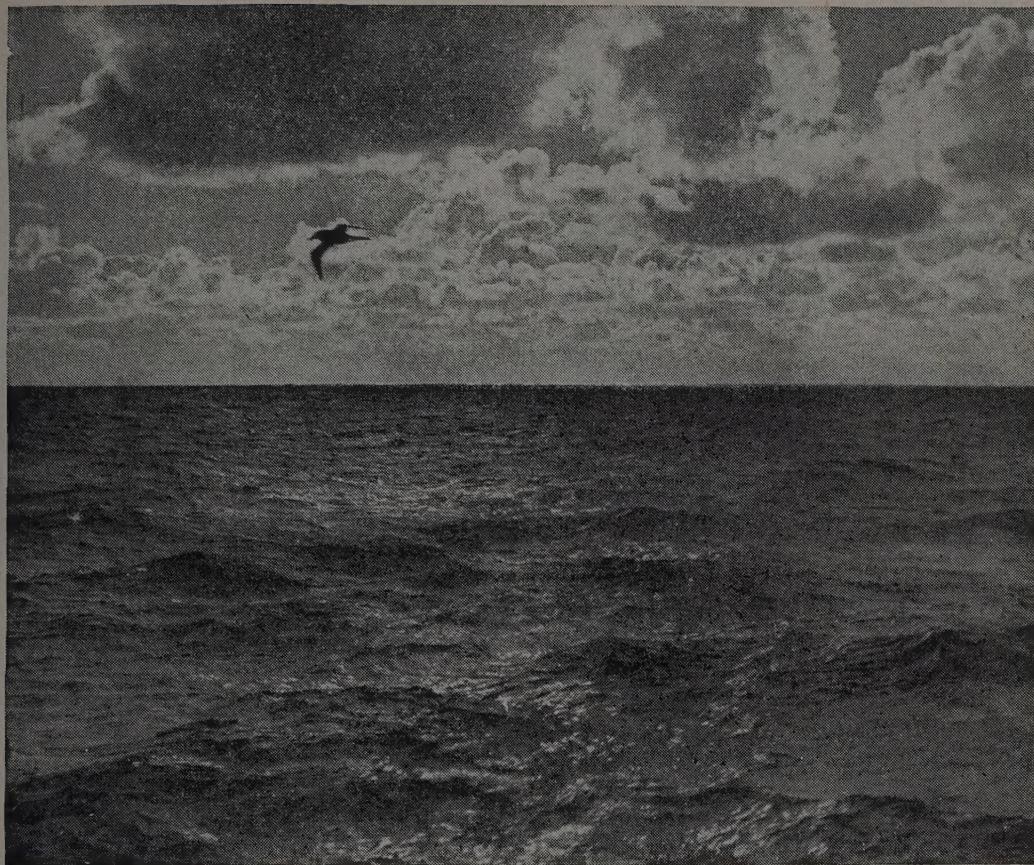
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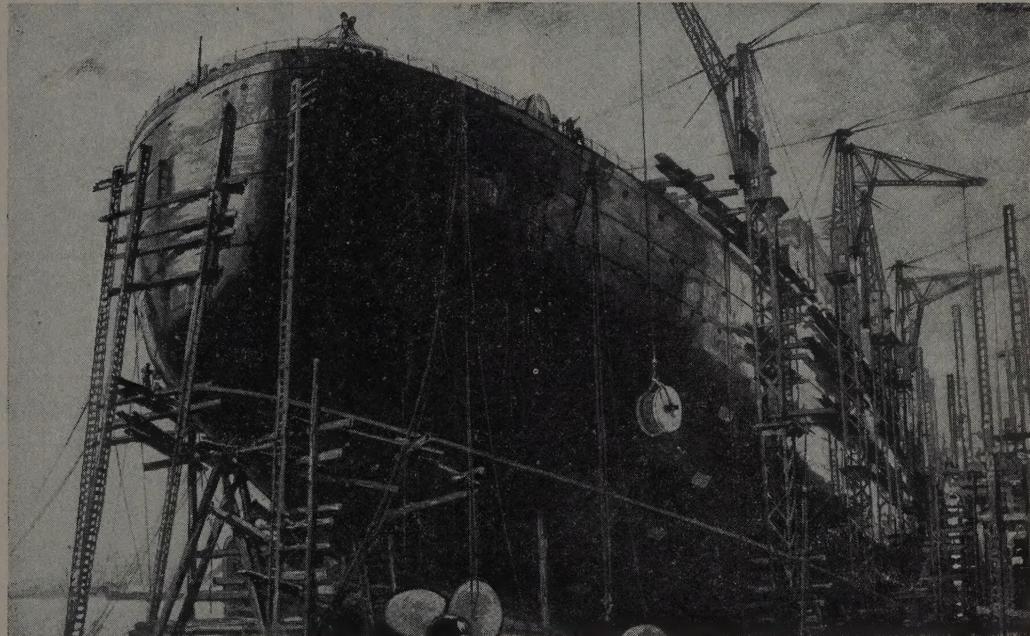
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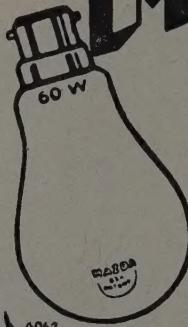


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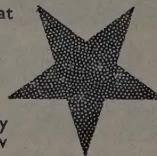
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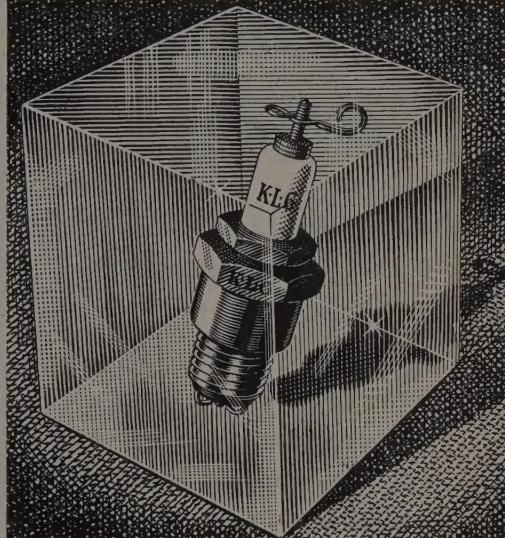


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East to the Indies

by GUY ROBERTS

It is easy to discuss recent British action in the East Indies in terms of prestige, self-determination or raw materials; but such terms, common though they are in European discussions, give no clue to the complex problems of human geography that must be understood before we can consider as sound any solution aiming at the peaceful development of the many Asiatic peoples living in the East Indian region. How and when did they get there? What is their relative importance and influence? What arrangements will best take account of these underlying factors and of local cross-currents? Mr Roberts will suggest some answers in successive articles, of which this is the first

For the last few months events in Java and Malaya have drawn our interest to places, names and political movements with which few of us are familiar, and have forced us to realize that that strange world of tropical islands is much less idyllic than we had supposed. Far away on the opposite side of the great Eurasian land-mass, the East Indies have a long history, the strands of which are inextricably tied up with its geography.

The four principal units of this region, Malaya, Sumatra, Java and Borneo, are separated by the South China Sea, the Java Sea and the Malacca Strait, narrow waters which contain hundreds of small islands.

This complexity of land mingled with sea justifies describing the region as amphibious, the more so because swamps and marshes fringe the coasts. Water is so much a feature of the landscape that local people prefer to keep to the rivers and seas, rather than try to move through the equatorial jungles.

No less significant is the size of this region. From the northern end of Sumatra to the eastern tip of Java the distance is about 1800 miles. You could only just fit these two islands into the Mediterranean Sea. To get a sense of proportion about this unfamiliar zone, look at the map of the East Indies superimposed on the map of Europe. It will not



1

Margot Lubinsky



2

Mrs Branson De Cou, Black Star

be surprising then that, though many parts of the East Indies are still virgin jungle, the people living there total about twice the population of the British Isles.

These people of the Indies are of remarkably mixed origin. Newspaper correspondents reporting from South-East Asia refer to the Chinese in Malaya, to Arabs in Java, to Indians, Malays and Javanese. How has it come about that all these different people are living together in a sort of racial patchwork? Why is it that, beside the indigenous people, the Sumatrans, the Javanese and the Malays, there are so many Chinese, Indians and Arabs, all claiming that they have been settled in the Indies long enough to establish political rights? The question is the more justified because it would be difficult to find people more diverse in physical and linguistic characteristics than those now living in the archipelago.

The answer lies in the fact that this region has been the scene of continuous colonial activity for at least two millennia. In this colonization, the European influence—that is, the Portuguese, Dutch and British, has been far slighter, more transient and less racially confusing than the Asiatic. The historical geography of all South-East Asia has been influenced by repeated movements



4



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Pictorial Press

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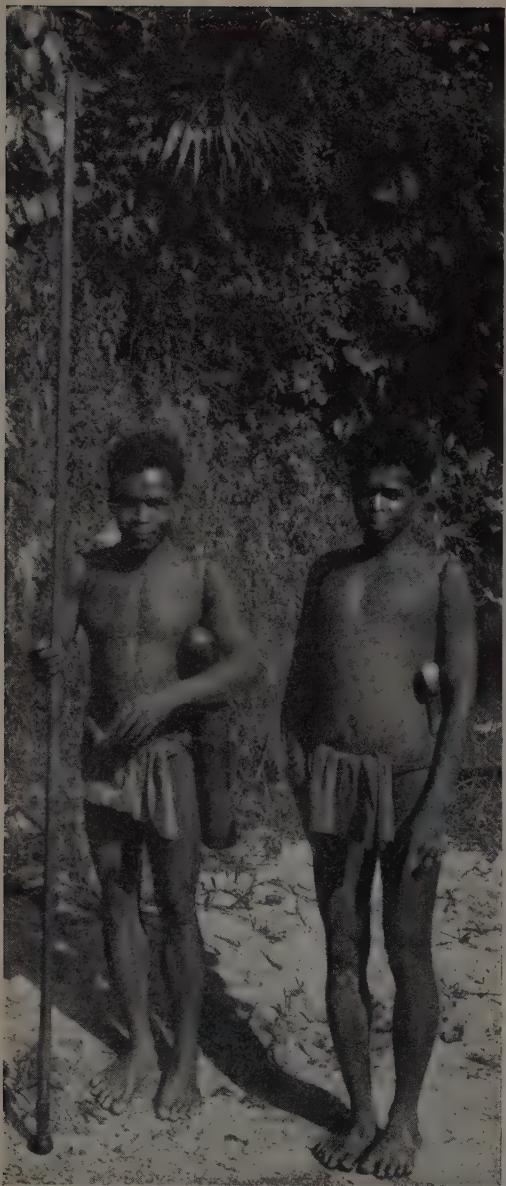
1. Chinese and Indians take part in the fishing of East Indies waters as well as the indigenous Malays and Indonesians. The Chinese fishermen have an eye on the needs of the Chinese of the towns—and they like shark

2. Each island and district of the East Indies still has a distinctive kind of headdress. The general type of the headdress resembles the Indian turban but the Indonesian patterns and twisted corners are peculiar to the region. Here are two dancers whose headdress and clothes indicate that they come from the mountains of Central Sumatra

3. His specially elegant headdress and beautifully carved kris handle proclaim the high rank of a noble from Bali, where some of the finest Hindu-inspired art of Indonesia is still enthusiastically cultivated

4. The crafts are so much respected in Indonesia that craftsmen are at pains to claim their superiority over other workers. This Balinese silver beater has let the nails of his left hand grow long to show that he does not engage in rough menial work

5. A young Malay sailor practises knots as part of his naval training



Paul Popper

Two aborigines from the forested mountains of Malaya. One carries his blowpipe, the weapon of jungle people, and his quiver of poisoned arrows. With this, the aborigines can easily hit a penny at thirty paces

towards it from the west. Of these movements, the historic migration from India eastwards to the Indies has had the strongest cultural effects. We have only to think of our nomenclature—Indonesia, the East Indies, Indochina—to see this.

There were even earlier migrations into the asylum of the Indies. Borneo, Sumatra and Malaya have, in the jungles of their remoter mountains, aborigines derived from tribes which once, slowly pressed southwards from Yunnan through the forests of the Peninsula. These, the Sakai, Negritos and Jakun, as they are called in Malaya, are of that stock which moved across the narrow seas and, in the course of generations, went island-hopping as far as Australia.

Indian migration to the east was more spectacular because it was an organized movement across the Bay of Bengal. This water-borne migration established an emphasis on the shallow East Indies seas which they have never again lost. The how and the why of this migration eastwards for century after century are difficult to explain because the facts are so few. They are known only to a small group of Orientalists who admit great gaps in their picture of what has been the pattern of mankind in the amphibious Indies. Vernacular accounts of Asiatic travellers in South-East Asia are very scarce. The Indian and Chinese seamen, who for thousands of years sailed in these waters, have left no records of their own, no log-books and no maps. For this we have to blame the turbulence of social life in India and China, which has caused the loss of their records. No less destructive has been the heat and damp of the tropics and the ever-present pest of ants and insects. Nothing on wood, paper or cloth could withstand these agents of destruction. Kingdoms and empires have come and gone in South-East Asia and left nothing to show they ever existed. Except for the palaces and temples of Angkor Wat in Indochina and of the Borobodur in Central Java, these states have left no stone witnesses to their greatness. The absence of such historic material is explained at once by the destruction which the jungle is still working even upon the great carved stones of Angkor Wat. These monuments, Angkor and Borobodur, are foreign to their setting. In an environment so congested with trees, where the solid geology is buried under 50 or 100 feet of lateritic soil, stone is a rarity and the natural structural material is wood, bamboo and palm. No wonder stone buildings were the prerogative of kings in these jungles, and even tiled roofs forbidden to all but their nobility. The facts about the



Mrs Branson De Cou, Black Star

The destructive effects of quick-growing tropical jungle vegetation, in a temple near Angkor Wat

kingdoms are full of gaps because, in this part of the world at any rate, the tropical climate dictates.

The earliest documentary evidence about people in the Indies dates from the first century of our era and takes the form of descriptions of missionary work there by Buddhists. Buddhist missionaries then, like other missionaries later, were following the stream of trade. For the most part they were concerned primarily with making the journey between the two greatest concentrations of people in Asia, between India and China. For them and for the trading vessels which they used, the all-sea route between these places by way of the Malacca Strait was only one of several. They normally preferred the overland route from India to China by way of Kashmir and the Tarim Basin, but in the second, third and fourth centuries A.D. the stir and pressure of peoples in Central Asia made that route more risky than the sea route, whose perils at that time introduced an under-

tone of fear into all the accounts which have come down to us.

While the literature of early travel in South-East Asia is primarily that of Buddhist proselytising, it also records the pattern of mercantile movements. The peninsular and insular area east of the Bay of Bengal acquired the reputation among Indian sailors at the beginning of our era of being a 'Land of Gold'—Suvarnadvipa or Suvarnabhumi they called it. To Indians in those days it was an 'El Dorado' such as Central America became for European seamen in the Age of Discovery. Their name for the region has to be interpreted in the sense that the Indies were a source of trading wealth rather than that it was a region producing gold. On mineralogical grounds it appears unlikely that gold was mined on a large scale and none of the texts definitely refers to a gold-mining industry. It was, however, this Indian description of South-East Asia which Ptolemy incorporated into his geography as 'The Golden Chersonese'.

Streams of Indian merchants, adventurers and priests went eastward and colonized. They established the colonial kingdoms of Kambuja (Cambodia and part of the present Siam), Champa (the present Annam), Srivijaya (Sumatra) and Yavadvipa (Java). These colonies were Buddhist and Hindu in varying degrees and at various times, but all diffused Indian culture and traditions in the East. They imposed the Pali and Sanscrit languages. Their influence in religion, language and mythology has never disappeared from South-East Asia.

These Indian colonies, according to the accounts of the missionaries, were the focus of a continuous trading activity between India and China. The trade and cultural influence of India was much greater than that of the Chinese for the first thirteen or fourteen centuries of our era. In the economic structure of those times the function of the Indies seems to have been solely that of a point of exchange, a half-way house. None of the evidence available suggests that these Indian colonial kingdoms at first produced any articles which entered the steady stream of trade between China and India. At that time the Indies were not identified with the spices for which they became famous later. One archaeologist has suggested that the kingdom of Cambodia had its economic basis in exporting the wings of kingfishers to China for ceremonial head-dresses. This may seem too poetic to be real but we cannot dismiss the suggestion lightly. To the people of the Indies it seems equally incredible that the spices which grow there so profusely as to be regarded as valueless, should become prized articles of trade with Europe.

At first the Indian travellers and merchants preferred to avoid the détour round Malaya. Their ignorance of wind systems and navigation made that sea route both dangerous and long. Hence their earlier practice was to disembark somewhere on the coast east of the Bay of Bengal and travel by land routes across Suvarnabhumi (the Kra Isthmus and Malaya), to re-embark on the other side, or to contact other merchants who travelled from the Far East as far as the peninsula by sea routes through the South China Sea and round the Gulf of Siam. The ways through Suvarnabhumi gradually changed. There was a famous trading centre, called Takhola, far south on the isthmus, but its exact location has not been agreed upon and it has left no remains. Since, however, it was linked by a land route to the Indian colonies of Singora and the neighbouring Patani in the southern Gulf of Siam, it is possible that Takhola was

somewhere in Kedah, from which district there are easy routes through corridors to Singora and Patani. The Indian merchants may have used a route much further south in central Malaya, where even recently it was possible to take a small river craft up the Muar River (just south of Malacca) and, by merely dragging the boat through thick beds of reeds in shallow water, to force a way to the Tasek Bera (a lake in South Pahang) and thence to the Pahang River and the East Coast. The presence of Indian carved stones near Malacca and Muar lends strength to this possibility, as does the long-standing conception of early Indian navigators that Malaya was a series of islands rather than a continuous land-mass.

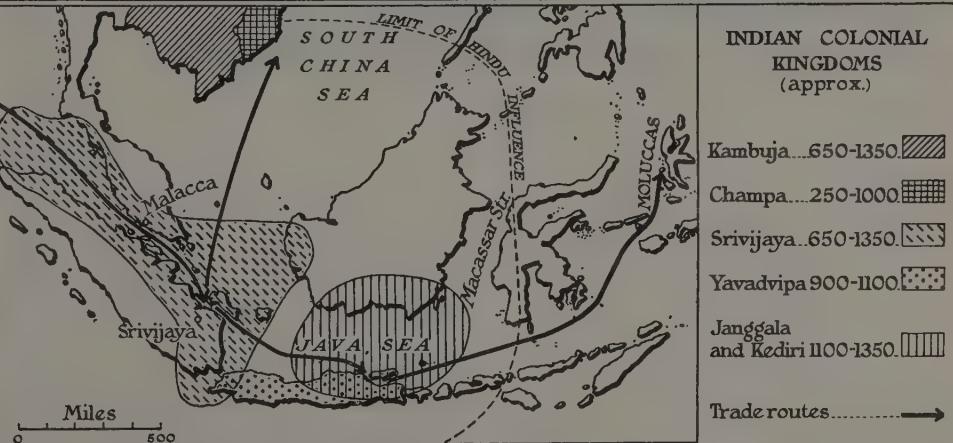
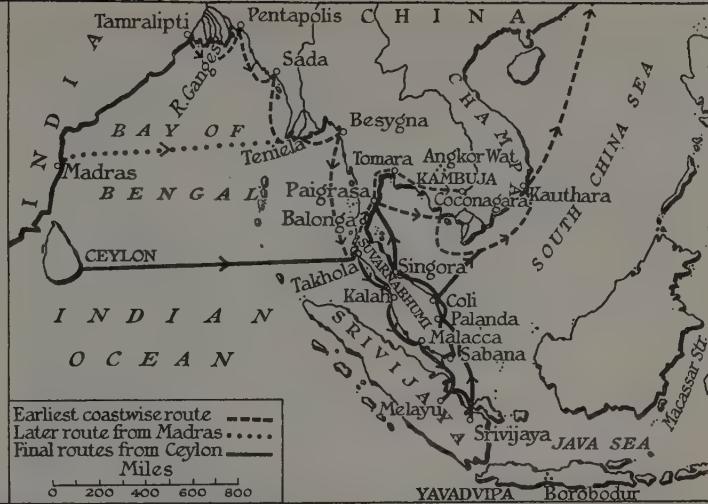
As navigational skill increased and the risk of the sea route round Malaya became less of a liability than the costs of the land routes and the incidental taxations imposed by the Indian adventurers who settled astride them, the merchants increasingly made their voyages entirely by sea. Just as Indian colonies had grown up on the land routes, so new colonies of Indians became established across the routes through the archipelago.

Because the sea ways are relatively narrow and restricted, the Indian kingdoms which grew up there acquired a well-marked pattern. To be able to control the trade going through these seas, the kings and the adventurers had to command both sides of them. Hence each kingdom tended to be arranged symmetrically, with one of the sea routes as its axis. Thus the kingdom of Srivijaya consisted essentially of the Malacca Strait as its axis with west Malaya and east Sumatra as its lobes. Other kingdoms, Janggala and Kediri, bestraddled the Java Sea and the Strait of Macassar which was often used in the journey to China. The Majapahit kingdom of Java, which was responsible for the Borobodur, owed its power to its control of the Java Sea and the Karimon Strait (southeast of Singapore), and its hold on eastern Malaya, western Borneo, eastern Sumatra and the Java coast. Even the little kingdoms, those that failed to leave any great mark of their history, appear to have had a similar form, as though they were all sea-kingdoms, merely harbouring on the surrounding coasts.

Srivijaya, established round the Malacca Strait, was founded very early, possibly before the Christian era, and only broke up finally a century or so before Europeans came into the Indian Ocean. From the 7th century onward Srivijaya, under its Sailendra kings, ranked as a powerful maritime empire whose influence stretched as far as southern India in one direction and China in the other. Its

EAST TO THE INDIES

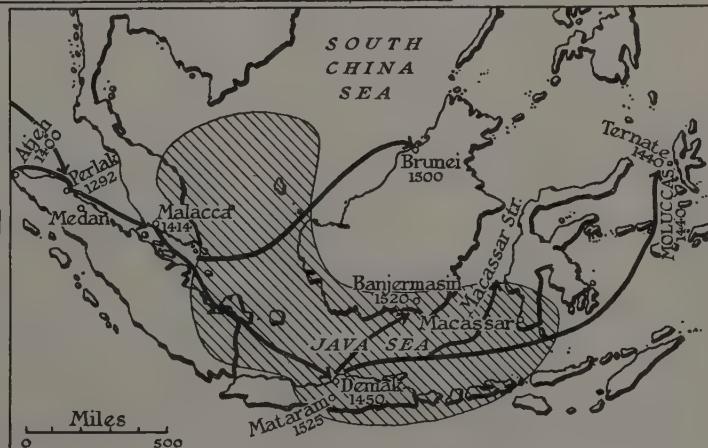
Evolution of routes during the period of Indian migration eastwards, 0-700 A.D.



THE LAST HINDU EMPIRE AND THE ADVANCE OF ISLAM

Majapahit kingdom (14th CENTURY) [hatched area]

Places are dated according to their conversion to Islam



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Mrs Branson De Cou, Black Star

Carved panels of Angkor Wat show dramatic tableaux of the Indian colonists who swept eastwards to found the kingdoms of Champa and Kambuja

capital is generally agreed to have been on the site of the present Palembang in southern Sumatra. The Srivijaya kings built a fort for themselves on the island which we know now as Singapore, and started other settlements in west Malaya, whose Indian place-names are now the only evidence of their association with the older Indian colonists. Few archaeological remains have been left to permit us a rational interpretation of life in that kingdom, though evidence from India and China shows that during its nine or ten centuries of continuity there was a steady stream of traffic and colonists from India towards it. There is, however, no suggestion of any return of colonists from Srivijaya to their old homes in southern India or Ceylon.

The oldest detailed account of a sea journey in these waters was written by Fa Hsien, a Buddhist priest who, after spending years of study in India, which he reached by the caravan route through west China and down into the Punjab, took the sea route home to China in A.D. 399. He describes how he set out from Tamralipti, a city at the mouth of the Ganges, in a trading vessel which sailed on its usual course south-west for fourteen days as far as Ceylon. Thence he sailed eastwards in what he called "a large merchantman". He took no less than ninety days to reach Java. Fa Hsien's voyage from Java to Shantung took him forty days. This is the

oldest indication of the length of time which vessels of the period took to reach the Indies.

Fa Hsien makes it clear to us that these Indian colonies were a pool for ideas, religions and commerce from India and from China, with the Indian influence predominating. Some writers of that time even asserted that Sumatra and Java were greater seats of Buddhist learning than India itself, which was reverting from Buddhism to Hinduism.

The movement of Indians towards the Indies was curiously one-way. Bagchi, in his *Le Canon Buddhique en Chine*, catalogues 105 instances of Indian missionaries who tra-

velled to China during the period A.D. 67 to 1326. Twelve travelled by sea. None returned by sea; they all came back overland. Of the eighteen known diaries of Chinese pilgrims to India from A.D. 399 to 1033, only one travelled throughout by sea. Only recently has it been possible to understand why this was so. The explanation lies in the wind systems of South-East Asia. In the South China Sea, the wind régime is such that for five months of the year sailors can rely on a steady wind to carry them from China to the Indies. Another four months have winds equally reliable to carry sailing vessels from the Indies to China. Across the Bay of Bengal the situation is different. For six months there are winds driving from the Indian coast towards the Malay Peninsula. Shipping on the Burma coast during four months can confidently expect a wind to take it to the central or south Indian coast. At no time of the year, however, does a wind blow regularly from the Malacca Strait towards India. Upon this physical phenomenon the early Indian adventurers were peculiarly dependent because their ships were keelless and had outriggers. They could not sail to windward. The carved stones of the Borobodur give us unique pictures of the Indian colonists setting out from south India with their families in outrigger boats which needed a following wind. It was, then, easy enough

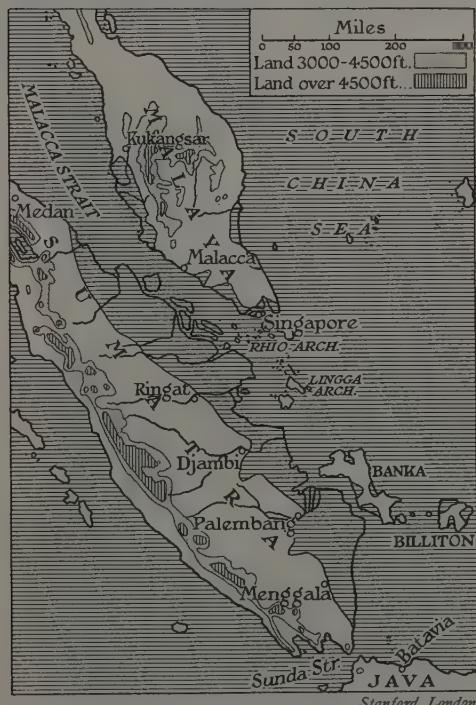
for the colonists to reach the Indies but difficult for them to get back again—a difficulty which in 1942 made it impossible for any of the British escaping from Singapore who reached the west coast of Sumatra to use native craft to take them to India. This was the physical cause of Indian settlement in the Indies as distinct from mere visiting. Because navigation back to India was so difficult, the earlier pack routes from Siam into Burma and thence by coastal ship to the Ganges never completely disappeared until very modern times.

The great puzzle of the region is the position of those harbours in Sumatra which were the seats of power in the heyday of Indian colonial expansion. It seems impossible that Palembang and Djambi, 50 miles from the sea, could ever have been important seaports, situated as they are deep within swamp-forest which even the present natives find not worth the trouble of penetrating. The old travellers have left no accounts containing details which help us to fill in this story. It is incredible that the 800-mile coast of east Sumatra, which is now continuous swamp stretching 60 miles or so inland, could ever have been the site of settlements important enough to be

recorded as the capitals of ancient kingdoms. Possibly the landscape has changed radically since then. In recent times it has been verified that the rate of erosion and deposition by rivers in Java may become so great during periods of volcanic activity far inland that the deltas and coasts have been built out a kilometre within a decade. If volcanoes of central and south Sumatra went through a period of activity between the peak of Indian colonization and our modern mapping, the rivers running from them into the comparatively shallow seas eastward could have built up the land which forms the swampy flats of east Sumatra. The tidal rhythms of the South China Sea and the Malacca Strait interact there in a way which may have encouraged alluvial deposition. Any similar build-up west of Sumatra would have been prevented by the seas which there shelf steeply to great depths and are exceptionally violent. Much light is thrown on the historical geography of the first millennium A.D. by allowing for the relatively rapid reshaping of the coast which tropical erosion and the profusion of volcanic ash make possible.

The reputation of the Indies as repositories of Buddhist culture declined as Hindu influence increased there, leaving the more northern Indian colonies, Siam, Indochina and Burma, as principal heirs to the Buddhist tradition. This development occurred when greater navigational skill and the use of the keel made it possible for shipping to return to India, increasing cultural interchange between India and the Indies, and leaving the northern colonies as backwaters, less in touch with the newer influences in south India.

By the 13th century, new tendencies were becoming apparent in the Indian Ocean. The trade in spices with medieval Europe by way of the Near East had become of considerable importance and Arab traders took part in it on an increasing scale, steadily pressing further east towards the source of the spices, instead of remaining satisfied with Indian intermediaries. The unrest on the plains of Central Asia led to the breakdown of the old Kashmir-Western China route, and increased the importance of the way through the Malacca Strait, at the same time establishing militant Islam there. Islam, like the other religions, moved into the Straits with the merchantmen of the Indian Ocean, following the trade routes and the traders, who at this period were mainly Gujaratis. Perlak, a village north of Medan in north-eastern Sumatra, was the first district converted to Islam in 1292. Malacca, which had become a great emporium and half-way house for the India-China trade, was Moslem by



Was this the shape of Sumatra and the Straits in the first millennium A.D.?

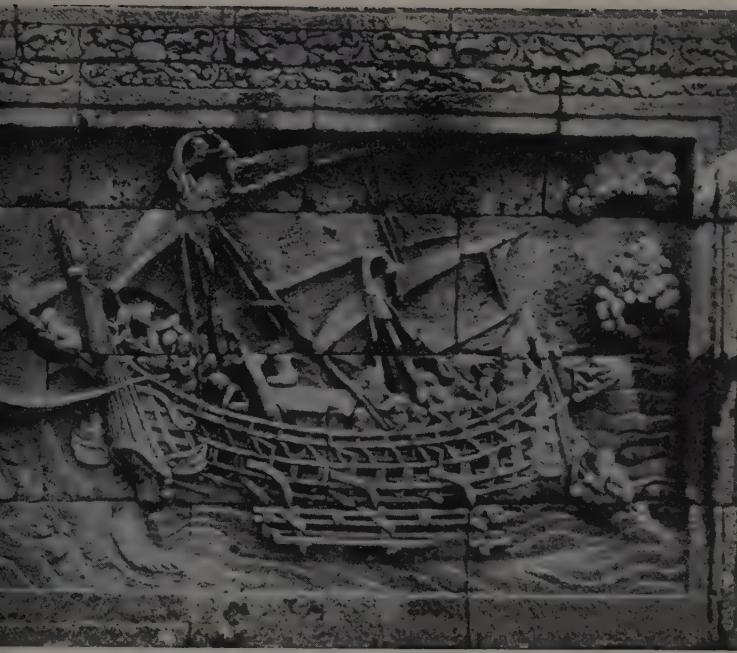


A bas-relief on the great Buddhist monument at Borobudur

A Batik village in the hills of east Sumatra

Paul Popper





A stone panel from the Borobudur in Central Java, which is full of domestic detail about the lives and ways of the Indian colonists. Here we see represented an outrigger sailing ship carrying colonists and their families from India to Java and, on the left, the stilted Javanese house of more than a thousand years ago

Paul Popper

Toni Muir



Compare this old panel with the photographs below, which show a modern Indonesian boat and dwellings. The style of stilted house has not changed. The sailing boat is still the most important means of transport in Indonesian waters, though the outrigger is no longer used except for the smallest canoes in the easternmost islands



Black Star

Modern Indonesians and Malays are Moslem: mass prayers at the festival ending Ramadan

1414, and the new faith spread eastwards from there to Demak (near Semarang in north Java) by 1450, although Ternate was Moslem by 1440. This chronology indicates that the route right through the Indies, from the Malacca Strait to the Moluccas by way of the Java Sea, was of greater interest then, because of its spices, than the South China Sea route, which was mainly concerned with the silk trade. Throughout this period Malacca was the chief centre of trade and of diffusing Islam. Not all sultanates in central Java were, however, converted until 75 years after Demak: Banjermasin accepted Islam after about the same lapse of time. The timing of the conversion of central Sumatra is unclear: its harbours had already ceased to be significant.

It may seem strange that the conversion of the archipelago to Islam was so complete and so quick, considering the area involved. To some extent the spread was illusory—only the coastal traders were at first converted because upon their conversion depended successful business with the Gujarati merchantmen. In the interiors of the islands the old faiths went on scarcely changed and Bali is an example of one island refuge of the Hindu tradition. The Hindu customs and practices still continue in the mythology and art of the Indonesians today. That mass conversions to Islam took

place we may doubt. After all, this region was one of oriental despots. Only the prince had to be converted: it was then assumed that his people followed, whether or not they did so in fact. The Malays, Sumatrans and Javanese after this lapse of time have become Moslem and they have adopted the cursive Arabic script. The Arabs did not, however, establish special colonies for themselves and they left no archaeological monuments.

When Europeans came into the Indian Ocean they ousted the Arab and Gujarati merchantmen and ended the Indian colonial influence in the east. There was no longer a natural migration of Indians eastwards. The stock from which the present Indonesians derive is far more Indian than any other, but Indians no longer go to settle in Sumatra, Java or the other islands. Not until rubber plantations were started in Malaya did Indians go east again—but this was politically arranged by Europeans, not a spontaneous movement by Indians.

Though the natural pressure of people from India in the direction of the Indies has been negligible for the last four centuries, there is evidence (e.g. Panikkar's *The Future of South-east Asia*, London, 1943) that thoughtful Indians are now speculating on the possibility of reviving their historic association with these islands.

A Visit to Les Groupements Druzes

by ANTHONY GROSS

"In Damascus, the townspeople try to cheat us as simple folk from the desert. But when we shout 'We are Druzes!' you should see the hubbub that follows, the women scream and the babies cry, the men go pale, the old tremble! It is laughable. We are a great people and all men fear us." This little speech was made to me by a Druze N.C.O. For the Druze men are real swashbucklers, as proud as Turkey-cocks, always moustache-twisting, but with a cunning glint in the corner of the eye!

I was now entering the Independent Territory of the Djebel Druze in the south-east of Syria, near the border of Trans-Jordan. The whole horizon had changed to a black stony desert, while in the distance stood a range of small hills like slag-heaps. The ground is made of volcanic rock and the earth is black. In places some poor crops glaze a wisp of green or brown over the soil. Everywhere I see tiny donkeys and foals and camels. But it is especially the donkeys, nearly all little black ones, that enchant me. They are everywhere among the stones and the fields of corn. It is the month of May but the Druzes are already reaping the harvest. They pile the sheaves onto the backs of camels until they disappear, while in front of them on the paths and behind them come little black donkeys with their foals. Once this harvest is in there will be nothing left and the land will revert into the great desert beyond.

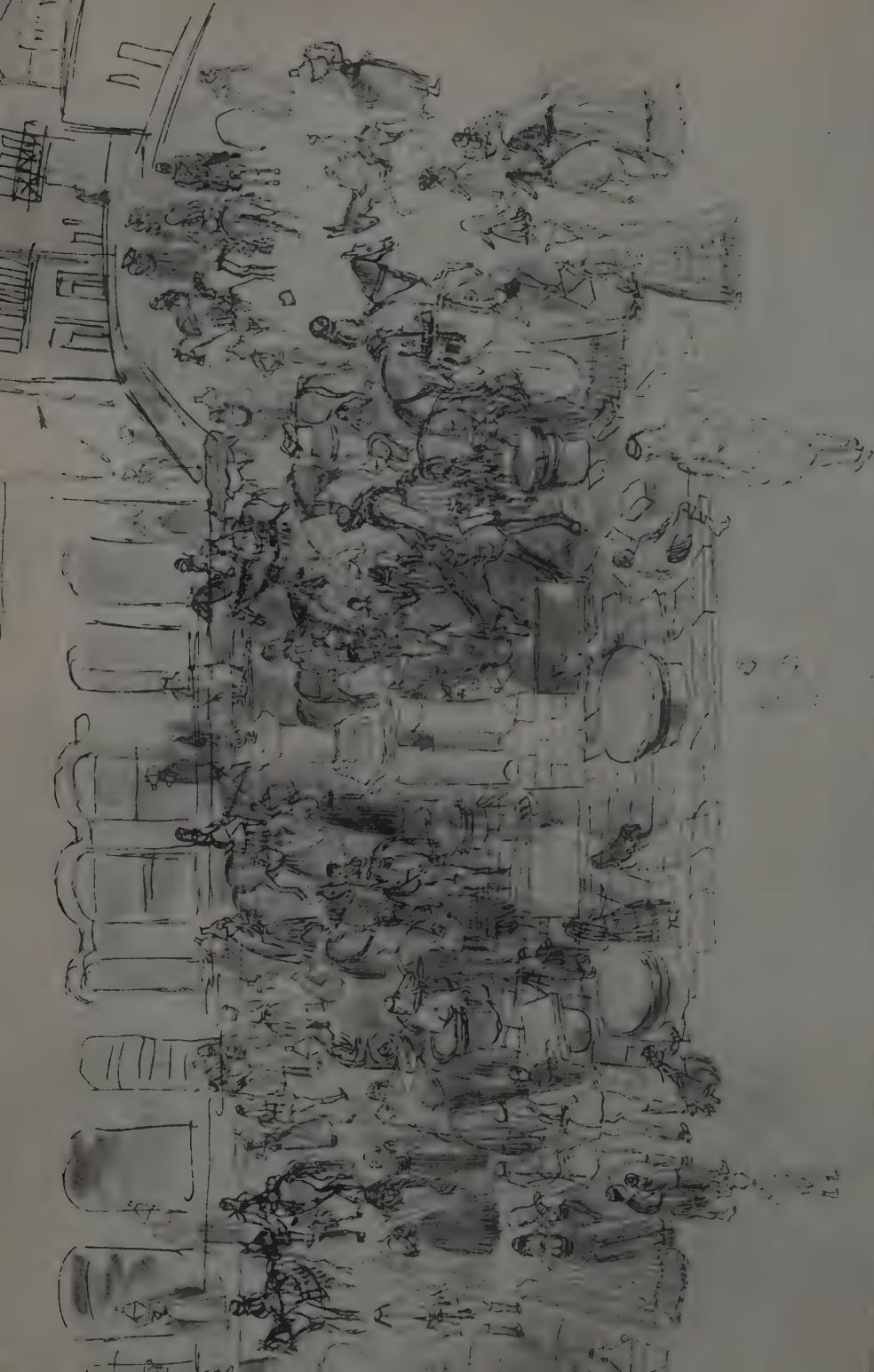
As I approached the town of Soueida I passed many flocks of sheep and goats and occasionally nomad Druzes, recognizable by the long plaited hair of the men; I saw a camel bearing a litter, being led towards the town by a family of these beduin. They intrigued me and, on enquiry, I found they were taking a sick member of the family to the Beduin Hospital. Here the entire family moves in and sets up camp in the ward. Children and grannies, mothers with nursing babies squat on the ground, cooking their food in the fireplace. Their own rugs and pillows are laid out on the floor, while outside their camels are tethered or with the rest of their flocks graze on a common allotted for the purpose at the back of the building.

Around the sick member, old women sit and pray or wail or laugh according to the circumstances. With the family, the vermin and flies move in as well. Should the authorities try to cope in more hygienic fashion, the beduin wouldn't come. The doctor told me, "They are so tough, they generally get better anyway." The slightest doses of medicine, such as would have no effect at all on Europeans, produce astonishing results. The remainder of the hospital is open to other patients and is run on normal modern lines. Most of the helpers and nurses are Druze, young men and women.

Outside in the town the men strut about, for the most part in the uniform of the Druze Guards, or else they sit in doorways drinking interminable cups of coffee and tea, or ride up and down to the fountains and ponds in various parts of the town, to water their horses. From their saddles hang gaily-coloured tassels. Their uniform is khaki while on their heads they wear the usual white turbans held in place by heavy thick rope.

The watering of the horses is quite a business. The Druze trooper dismounts at the water's edge while small boys quarrel with each other to lead or ride his horse into the pond. There is much splashing and swimming about, while at the same time flocks of sheep scramble down in clouds of dust to the water. Camels come galloping, stopping nervously, side-stepping clumsily till they join the others in the water.

But the real interest lies in the women. They are really lovely as they glide silently along the rocky paths, past ruined and decrepit houses, overlooking the craters of volcanoes long since extinct and filled with deep inky waters, through black streets where Roman columns lie haphazard in the gutter or are built as corner-stones into the walls of houses. Their clothes are truly magnificent. Long ample skirts sweep down to the ground. These are in the brightest colours, a raspberry pink, or a lemon yellow or turquoise blue. Some are in ochres and in front they tie a long pinafore in another bright colour. The materials are heavy. They wear a short jacket in black velvet, deeply *décolleté* or open



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A pile of broken Roman columns marks the main fountain in Suez, whose water is turned on at fixed hours during the day. Then the Druze women, in their magnificent attire, assemble in chattering queues with water-jars while the men ride down to water their horses.



All illustrations by the Author

The Emira Attrache gives a party, "dressed in the latest fashion but wearing . . . the veil of her country." So busily elusive a hostess could not help getting into the picture twice

down to a belt, decorated with gold coins. They wear a wispy muslin blouse which shows up their breasts. In their hair and on the forehead are woven and hung many more gold coins, and lastly they wear a little fez perched on the top of the head from which is draped a long, slightly transparent white veil which reaches down to the ground. This they hold in position, covering the lower part of the features with one hand, while with the other they help balance a large tin water-can borne on a pad on their shoulder.

It is a frightful crime even so much to glance at a Druze woman. The Druzes are jealous and are allowed to punish such an offence by stoning the offender to death. But it was with the little girls of five or six that I fell in love, dressed just like their mothers, running and playing about in the streets, barefooted with their ample skirts held up, bulging out under their arms. I tried to draw some of the women and, with a bodyguard of Druze soldiers, climbed up onto a roof-top overlooking the main fountain of the town. I managed to put down many notes on their dress, but was really too far away to see all the detail I would have liked.

The most beautiful of all the Druzes is their princess. The fame of Emira Attrache has spread even to Cairo, not only for her loveliness but for her wisdom. I was able to meet her at a reception she was giving to the Druze

elders. She was dressed in the latest fashion but wearing draped lightly from the hair and shoulders the veil of her country. She held herself gracefully as she led the dignitaries to their seats of honour. The guests were placed in order round the walls of the several rooms that made up her *salon*. It was amusing to observe how tactfully she placed them and her little smile and short laugh when she realized a mistake and changed some notable to a higher place without offending the others. At last the guests were all seated around three enormous dishes. On each was a sheep boiled whole and reclining on a mountain of rice and pine-nuts. She then came to me and spoke in French, for both her manner and her speech were Parisian. Her fingers just touched my sleeve, as she led me to a spot from where I could paint the scene. Here a young member of the family was detailed to see to my needs. As I worked she came from time to time and glanced over my shoulder at the drawing. She was delighted when her kinsman, who had sat with his eyes glued on my brush the whole time, told her she was in the picture twice! For she was flitting about everywhere at once and was most elusive to draw. I asked her—for she seemed so sophisticated—if she could arrange for me to paint her and some Druze women in their national dress. The laws of hospitality forced her to promise to do all in her power to fulfil



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(Above) Paved streets at Shabha, a village built into the ruins of a Roman town. (Opposite) In the guest tent of the Druze Camel Company, apéritifs are offered by a Druze officer pretending to be French—but are declined by the tactful. The Druze beduin soldiers wear their long hair in plaits

my wish. A few days later two high members of her family called on me in person to excuse the Princess, who had been called away unexpectedly from Soueida! It is impossible to evade Druze laws.

By now the whole town was agog with the forthcoming races. A large common near the barracks was being prepared. Carpenters were putting up stands and others were measuring and marking out the field for the exercises and displays. The streets were filled with a bustle of horses queuing up outside the blacksmiths' and saddlers', while up in the barracks there was a great furbishing and toileting of horses and excited preparations. I seized this last opportunity of visiting Shabha, a picturesque Druze village not far from Soueida. Ruins of a Roman town make up the village. Wide paved streets cross its length and breadth, and the houses are built in the ruins of Roman dwellings. A small amphitheatre and an archway, or rather tunnel under the masonry, I remember as outstanding. I made a drawing of one of these streets in spite of a large crowd of

Druzes gathering around me. The clothes of the women and little girls looked lovely in these classical surroundings.

My host interested me greatly: a very youthful French officer, living by himself in this outpost of the French world. He had arranged the interior of an ordinary Druze cottage with frugal elegance. The room was furnished with couches strewn with saddle-bags as cushions. On the walls hung Arab firearms, daggers and swords. He pointed to one of these: "With that sword", he said, "my great-grandfather fought a duel with Napoleon at Ajaccio." His views on administration harmonized with the decoration of his dwelling—that it should be rough and summary on the outposts, so that kindness and culture can flourish in peace in the interior of the sphere of influence or the colony. A most luxurious meal which had been cooked outside was brought in by some flirtatious but heavily veiled Druze girls. In the evening we returned to Soueida. The jubilations were due to start that night.

From now on it was a continual round of

festivities. We were invited for *apéritifs* by the commandant and each officer in turn. Then the princess Attrache herself gave one, and each of the higher Druze officers, whose rank corresponded to local or Viceroy-Commissioned Officers in the Indian Army, gave theirs. I was invited to one held by the officers of the Camel Company—formed from beduin Druzes—and was received in the guest tent by one of these Druze officers, who tried to look as much like a French officer as possible; on the tables were lined up many bottles of *apéritifs*, old and dusty bottles, all of them corked and sealed. I was solemnly offered a '*pernod*' or whatever I should like, but I had been forewarned to decline. For these bottles have been carried about everywhere for the last twenty years, and are only produced for the benefit of being looked at by European visitors. A French officer ruefully remarked, "They are probably the only truly pre-war French *apéritifs* left in Syria."

After partaking of a series of cups of sweet tea and very bitter coffee in thimble-sized cups ("for the digestion", as my host said), I was led to another tent from which came a great noise of clapping and shouting and strains of music. We entered and made out, through smoke and by the light of an oil lamp, two beduin girls dancing and banging tam-

bourines. A man was fiddling on a one-stringed banjo made of rough planks. Another was playing a flute while a third was thumping out a very syncopated rhythm on a drum. The whole scene was wild and turbulent, the onlookers gesticulating, shouting and laughing. I inquired who the dancers were and was told that they were strolling players, beduin gypsies who wander from one nomad encampment to another all over the desert, entertaining as they go. As the tempo of the dance increased the dancers approached each man in turn, casting provocative looks at him, while he, out of himself with excitement, threw a 50-franc or 100-franc note into the space where they were dancing. For the Druzes vie with each other in the lavishness of their gifts and in the grand manner of giving.

At last the final day, the day of the *Carrousel* was due to start. The grandstand groaned under the crowds of onlookers. In the centre were the French officers and the principal Druze families. The rest was made up of Druze soldiers and their relations—in fact the entire male population of the town and its surroundings. Those who could not get onto the grandstand were stretched out ten or fifteen deep for a hundred yards on either side. Near the town, on a series of small

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The great festival of the Druze Horse Guards is the Carrousel held near Soueida. Proceedings include complicated exercises, displaying beautiful horsemanship in the French military tradition

mounds of rough ground, the women-folk were scattered in gaily-coloured groups. Everywhere children were running and worming their way in and out of everything and everybody. The actors stood in troops and squadrons in their proper places. The horses were matched in groups of brown or grey or black. Lances were held aloft gallantly with gay pennants flying. The suspense was at its height when several horsemen rode out and gave the sign for the proceedings to begin with long-drawn-out blasts on the bugle.

The horsemanship was remarkable and a very military Carrousel it was. They rode round and round at the trot, then at the canter, more and more cavaliers entering the arena. The exercises developed from two to three abreast, riding nose to tail. The horsemen, sitting erect with their lances in the air, weaved in and out executing many complicated figures. They changed to four, to five, to six abreast, the walls of their lances held perfectly in line. The crowd became more enthusiastic all the time, and when a particularly complicated figure had been executed in this formation and we all thought the climax had been reached, we were suddenly sur-

prised by the roar of cannon fire. From all sides troops of cavalry charged down from the surrounding hills, while from over the brow of a nearby ridge appeared armoured cars firing automatic weapons. In a trice we were in the middle of a hectic mock battle. The onlookers cheered and jumped up in their seats. The excitement was terrific. Rifles were banging away in all directions as much among the audience as among the actors. From now on I couldn't see a thing as I was down on my hands and knees protecting my picture and my paints and brushes. So ended a great day for the Druzes, a festival which had not been held for several years owing to the war.

When I called on General Catroux in Beirut to obtain his permission to visit and sketch pictures of French local Syrian regiments I found that the guard of honour was composed of Druze guards. On this occasion they were dressed in full ceremonial regalia. I was greatly amused at seeing Arab girls in ultra-modern skirts but wearing the inevitable black veil, as much under the spell of the magnificent Druze Guard in Beirut as their British counterparts so often are under that of the Horse Guards in Whitehall.

Period Ornament, Writing and Symbols on Maps, 1250-1800

by EDWARD LYNAM, D.Litt.

THE graceful designs and artistic colouring employed in the cartographical representation of natural features which we have followed through five centuries are evidence that every map can naturally be 'decorative'. Examples of colouring, and of the development of the symbols for mountains, woods, towns, seas and sea-shores were given in my article in the December number of this Magazine.

SCRIPTS

The script used for titles and place-names is another integral part of maps, which adds character to their appearance and abounds also in dainty period bows and flourishes. From a very early date cartographers took pains to use the clearest lettering they knew. The writing in figs. 1 and 19 is in the common—and for those days very legible—book-hand, the 'Charlemagne' or Gothic hand. This script was continued later on, between 1482 and about 1560, in maps engraved on wooden blocks by Germans (figs. 9, 13); and of course modern German print, like the Gothic letter and Black letter of our early printed books, descends from it.

During the 1470's the discovery by Italian Humanistic antiquaries of the beauty and dignity of the old Roman inscriptional lettering, and the invention at Rome of a new form of handwriting which combined speed with beauty, the 'cursive Chancery hand', caused a great change in the lettering of maps. Roman capitals were adopted as the only script on several of the earliest atlases ever published, 1477-90 (figs. 20, 21), and were used always thereafter, though in combination with other scripts. In any style of engraved script there were, of course, many slight variations, good and bad, introduced by the engraver, who, unlike the printer, had liberty to fashion letters very much to his fancy. Fig. 36 shows handsome Roman capitals engraved in 1579. Between 1500 and 1570, the period when they led the world as cartographers, the Italians generally combined Roman capitals with a small upright, round script midway in style between hand-writing and ordinary or 'lower-case' print; but they

also used small italics instead of this. The Flemings, who ousted the Italians from their supremacy about 1570, introduced on their maps a type more like small print than the Italian script, but used italics for most features. Italic lettering as we know it originated in the cursive Chancery hand. The beauty and possibilities of that hand caused it to be taken up by notable writing-masters in Italy, Spain and France, who soon invented many charming varieties of it; and by 1580 it was known universally as the 'Italian' or 'Italic' hand-writing, with sundry adjectives such as 'French', 'Set' or 'Bastard' to distinguish its numerous forms. Printers like Aldus had early simplified and disciplined it for use in books, but it was the map-engravers and the publishers of engraved writing copy-books who exploited its artistic possibilities. The successive fashions and fantasies of the writing-masters can easily be identified upon our manuscript maps right down to 1860; but the men who designed the lettering for engraved maps restrained their artistry, showing a sound respect for the purposes of a map.

From 1570 to the end of our period italics—as, for convenience, we shall call all small sloping hands—were the most common and also the most distinctive lettering upon maps. Until about 1600 four kinds were used, two of them capitals, two minuscules, according to the importance or nature of the features described. Figs. 4 and 23 show scripts of 1574 and 1579 which, though different, are almost identical with hand-writing. For capitals the authors of these, like those of other contemporary maps, contented themselves with a larger type nearer to the Italian hand, e.g. Dunaw in fig. 23. Figs. 6, 15 and 24 illustrate 'italics' which, though much plainer, were still based on the exquisite manuscript hands of this period. A lovely example of the real Italian hand is seen in the verses below Magellan's ship in fig. 22, though that was a special effort, ordinary italics being used elsewhere. The lettering in fig. 11 shows a greater approximation to print, and this tendency increased during the 17th century; by 1690 the italics upon maps

had parted company with the 'Italian hand', becoming rounder and more widely spaced (figs. 12, 14). Willebordus Velt in fig. 12 and Wabridge Forest in fig. 31 illustrate, however, an ancient custom of distinguishing forests, chases and moors by a special type resembling hand-writing. During the 18th century the italic was still the most hard-worked script upon maps, but it developed into three forms. The most characteristic was a tall, light-faced type, seen in *la Madeleine* on fig. 26 and *Madeley Court* on fig. 32. The second, an imitation of the English 'Round Text' hand-writing of the period, which English merchants and their clerks were making the most popular hand in Europe, is used for the descriptive legends on fig. 31. The third, a bold-faced type, is illustrated in *Throckmorton* on fig. 31.

The lettering upon maps which imitated ordinary print was for long undistinguished, showing little of the engraver's skill—see *Swyndrechts* in fig. 12. But when, towards the end of the 17th century, printers began to design more artistic and varied types for their books, the map-engravers followed suit. Thenceforward the history of this type upon maps is closely linked with the history of printing, but the engravers usually produced more pleasing letters, with thick and thin lines delicately balanced (figs. 31, 32, 37). Capitals were always the predominant letters in titles. The Italians used them in combination with inscriptions in a handsome running hand very like that of the verses in fig. 22. A variant was graceful italic capitals (fig. 15), which was favoured by Flemish, English and Dutch cartographers in the late 16th century; but the enormous flourishing letters at the top of fig. 22 (which also appear, in a less absolute form, on fig. 4) was a naughty habit of Dutch maps from about 1600 to 1660. From 1690 onwards map-engravers began to set out a proud and varied display of lettering in the titles of their maps. This is well illustrated by fig. 37, engraved in 1695 just when the French had begun to wrest from the Dutch their long cartographical supremacy, and by fig. 29, dating from 1793, when the English in their turn had superseded the French. Gothic capitals had been used, of course, very early upon German and Dutch maps; but after about 1735 they became increasingly common in the titles of English maps, obviously in consequence of the influx of Hanoverians. Hollow capitals like those in figs. 18 and 29 had occasionally been used for names of provinces or cities as early as 1570, but after 1740 they became popular, with beaded stems (fig. 29). By the end of our period the lettering upon maps had, except for the 'lowering

case' Roman script, come very close to that in the engraved copy-books of the time. Indeed the panel in fig. 29 might almost be a page from one of the copy-books by Thomas Tompkins, an 'eminent Professor' of writing, whose portrait was painted by Reynolds and who was a friend of Johnson, Sheridan and all the notables. The Round Text hand illustrated in the fourth line from the top was chosen, complete with flourishes, by the Ordnance Survey for the titles of its earliest maps. How faithfully the draughtsmen of maps had come to imitate engraved hands by 1792 is shown by the writing on fig. 7, an extract from a manuscript estate plan of that date.

CARTOUCHES

The insertion of pictures and decorative designs upon maps began very early. From the 12th to the 14th centuries the Garden of Eden was frequently represented at the top. As everybody knows, Paradise was formerly situated—though perhaps that is not so true now—in the Near East, so that all early world-maps were oriented with the East at the top (whence our words 'to orient'). Besides, as most of them were drawn upon sheepskins, the projecting neck at the upper end provided a convenient blank space for edifying pictures. The Hereford map of c. 1306 has a terrifying representation of the Last Judgment along its upper edge, although the moral force of this is rather weakened by a pleasant drawing, some inches lower down, of the author of the map riding out a-hunting. On the earliest engraved maps the title appeared, very briefly expressed, in the upper margin, and later, during the early part of the 16th century, French and German cartographers inscribed it upon a flying scroll like that in fig. 10—which however bears the scale, not the title. It was the Italians who invented the 'cartouche', or panel bearing the title and other facts about the map, surrounded by an ornamental frame. The first form of the frame was a 'strapwork' design, imitating the ends of interwoven lengths of soft leather with edges curling forward all round the inscription. By 1550 it was a large rectangle, engraved to look like carved wood, with curled pieces which projected to hold the panel and supporting wings, posts and crockets at the ends. With Roman capitals and 'Italian' script in the titles, these cartouches had a great and simple dignity.

The Flemings and Dutch when, after 1570, they displaced the Italians as the chief publishers of maps in Europe, were full of enthusiasm for Renaissance art and architecture, but understood very little about them. They had, however, a passion for ornament for its

own sake; and accordingly for the cartouches of their maps they used indiscriminately, with an almost riotous joy, each and all of the many designs and motifs which they found in the pattern-books of Italian Renaissance sculptors, wood-carvers, stone-masons and plaster-workers. The result was highly ingenious, but bewildering. Around a stately frame imitating fretted and morticed wood-work, deriving from the hammer-beam roofing, corbels and panelling of late Gothic halls and churches, they hung a multitude of pseudo-classical figures, fauns, masks, nymphs and Neptunes, together with an amazing variety of naturalistic engravings of storks, fish, butterflies, lobsters and monkeys (fig. 4). The startling effect of this artistic jungle was heightened by a lavish use of brilliant colours, which the Italians had almost completely avoided. In their hands and in those of the Dutch, with whom, cartographically speaking, they merged about 1595, the cartouches of maps became a special branch of art, the sources of which were at first Renaissance, but later contemporary, handbooks of interior and architectural ornament. Many of them were beautifully engraved, for the Flemings and Dutch generally surpassed the Italians as line-engravers and for a long time the English and French had to learn from them; but the cartouches had little relation to the maps on which they appeared. Ornate cartouches rather smaller than those around the titles were introduced for the map-scales about 1580, and later also for the dedications. Fig. 15 shows inept caryatids which, because the Romans used them, were carved upon the pilasters supporting the galleries and fireplaces in dozens of Elizabethan mansions and were favourite figures on maps. Two appear in a design on the head of a bed used by Anne Hathaway's parents at Stratford. The English of the Elizabethan age understood Renaissance art even less than the Dutch, but these vivid pictures appealed to their love of colour and pageantry.

For nearly a century after 1595 Dutch cartographical engravers and publishers were the best in the world. Soon after 1600 the cartouche imitating large and intricate wooden frames supporting the panel was gradually abandoned for the old strapwork design, but in new forms and with additions which made it almost unrecognizable. At first the neat frame with its projecting scrolls, wings and volutes, which now resembled plaster-work rather than leather or wood, was garlanded with festoons of coloured flowers and ribbons. Very soon a swarm of plump cherubs appeared, whose duty it was to hold up the festoons, carry surveyors' chains and other

instruments along the scale and generally look ornamental (fig. 16). The first begetter of those unwanted infants has never been discovered; but they infested Dutch, English and German maps from about 1640 until after 1790. About the same time, in the 1640's, a geographical decorative theme was introduced. Groups of rustics, fishermen, milkmaids, bearded Muscovites and ebony-skinned Africans, in fact the idealized inhabitants of the country depicted, were grouped, with their appropriate implements and domestic animals, around the cartouche and title, as if about to be photographed. A Dutch alternative to strapwork, a large scalloped shell, became common, and around it anything marine, from Neptune in his chariot with insipid nereids splashing him to a naval battle with porpoises heading the line, was engraved.

The increasing richness and colour of the interior decorations in Dutch houses, produced by unequalled craftsmen and artists, are reflected in map cartouches of the 17th century. Together the motifs make up the Baroque style, probably the richest ever evolved in its tremendous vigour and its capacity to include every kind of art. It was at its height about 1685, and its effect in the elaborate illustrations and cartouches on maps is almost overpowering. The console or tapering S bracket, enriched with colour, moulding and leafage (fig. 3), was popular as a flanking support to the title. It may still be seen in the gables and mantelpieces of houses built about 1695-1715. Allegorical representations of the Four Continents decorated maps occasionally from 1580 into the 19th century. They may be seen, carved, around the Albert Memorial; but they flourished upon maps of this period (fig. 27). Europe was richly dressed, bore a sceptre, crown or globe, or all three, and had a horse or a bull beside her, while Asia wore a turban and flowing robes, carried an incense-burner and was attended by a very nice camel. They had, however, serious rivals in the livelier ladies who represented the Four Elements, another Baroque theme on maps. All through the century the classical tradition pervaded many branches of art, and brought crowds of stage Romans into the vacant spaces on maps (fig. 17). Indeed this figure illustrates some of the commonplaces of Baroque 17th-century ornament.

With the advance of the French after 1690 to the position of the world's greatest cartographers, their fine sense of proportion and form came into play in the cartouches of maps. Fig. 37 shows Baroque materials—a mask, a wild horse, pendants of grapes, and acanthus leaves curling outwards—disciplined

into a really beautiful design, with letters delightfully engraved to match it. But decoration on European maps outside France went through a period of transition between 1700 and 1740. The English Baroque style favoured a mass of flowers with a few small classical figures around the panel, or pendants of fruit, leafage, animals and weapons in imitation of the carved work of Grinling Gibbons. On other maps the chief ornament was composed of classical deities grouped as in Verrio's ceiling paintings, doing nothing in particular except perhaps thinking up love-affairs. On German and English maps these were sometimes replaced by the monarch of the moment, dressed in a fillet and buskins and reclining upon the clouds. Another, simpler, cartouche of the late 17th and early 18th centuries was a piece of tasseled brocade pinned up at the corners bearing inscribed on it the title of the map.

About 1740 the Rococo style of cartouche, which the French had been evolving for some years as a refinement upon Baroque, became general upon European maps. Its basis was a light frame composed of several (engraved) pieces of moulded wood shaped like inverted C's. Swags of foliage hid their joints. Fig. 28 shows two of them, apart, and they may have originated in acanthus sprays. The principal virtues of the style were lightness and elegance. Instead of the crowd of muscular heroes and all too buxom ladies of the Baroque period a few trim and slender figures now accompanied the cartouche. The spirit of Rococo design can be studied in the mirrors and other pieces of furniture which made Chippendale famous in the middle of the century. In the 1750's the Rococo cartouches for the titles of maps left the elegant drawing-room for the country. The panel bearing the inscriptions soon came to be engraved to look like an antique stone slab (fig. 18), enclosed in a Rococo frame draped with ivy or creeper, while beside it the people of the country or province depicted carried on their daily avocations. The influence of Piranesi's engravings and, in England, of the Society of Dilettanti's tastes are evident here, and still more in the cartouches composed of broken classic pillar and pediments forming a frame both for the title and for a view of a local landscape. As the Romantic movement gathered strength a spreading tree (fig. 18) or pictures of the natural features and products of the country (fig. 29) took the place of the Rococo frame. Yet even in its early, sophisticated days this frame had been completed by a fringe of delicate grasses or a shallow cascade (fig. 29). The dress and curls of the ladies in this illustration serve to date the map, apart

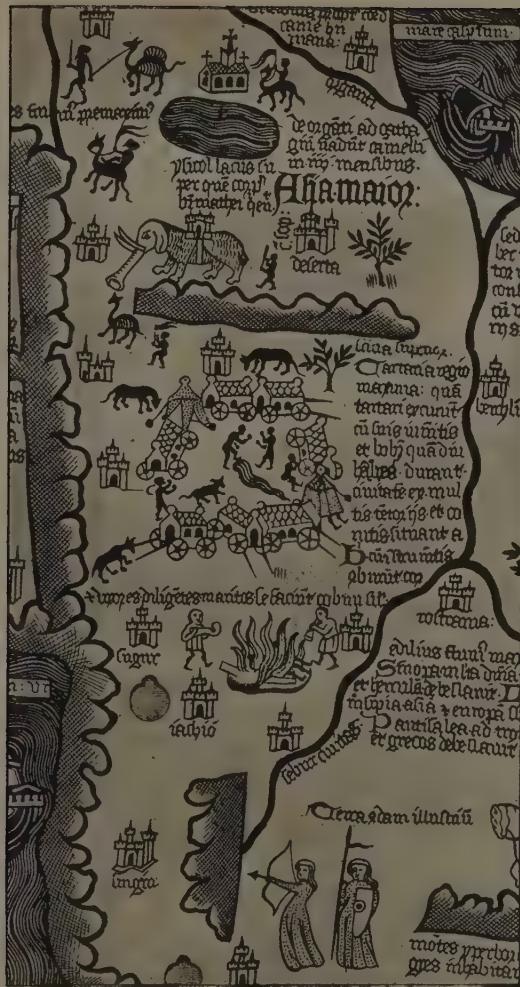
from its revealing scripts. And just as in 1670 special artists were engaged to engrave the Continents and the Elements, so this cartouche of 1793 was designed and drawn by one Barralet, while the scripts were supplied by a writing-master.

BORDERS

Borders around maps were the exception rather than the rule, columns graduated to show latitude and longitude being preferred (fig. 3). Elizabethan and Jacobean manuscript maps were often surrounded by a plain coloured band, and a similar band, coloured terracotta, appeared upon a great many engraved maps between about 1775 and 1810. Terracotta had been made a fashionable colour by Wedgwood and the Adam brothers. The colour-loving Flemings and English of the 16th century enclosed their engraved maps in a narrow border resembling a wood picture frame, coloured and moulded in various designs (fig. 15). The Germans, however, wanted something more sensational, and favoured a large border with rich Renaissance motifs (fig. 36). During another colourful period, 1690 to 1710, wide borders filled with floral designs were not uncommon. Fig. 35 is a fine specimen of French art of the mid-18th century, though borders were then rare on French maps.

CHARTS

On sea charts one of the most decorative features, the compass-rose, was a necessary part of the chart. The Italians did not colour it, but during the 16th century it was found desirable to show the 32 points more distinctly by colours, reinforced by the initial letters of the names of the eight chief winds (fig. 10). On most early compass-roses a cross marked the East, where the sun rose and which also had holy associations. The flags of all nations were drawn above their territories, for since a skipper might be forced by weather, accident or lack of stores or even mutiny to put in at a strange port, it was very necessary for him to know to what monarch every port belonged (figs. 2, 8, 10). The interior districts interested sailors little (unless they were deserters), for even raids for slaves or gold (fig. 2) would not bring them far inland. The artist who drew fig. 10 filled in the inland cities and mountains merely to show his skill. But wonderful and thrilling tales were told about golden cities far away in the interior of other continents, from El Dorado to Quivira; and these dreams of the past have come down to us in vivid colours and loving detail on many an early chart.



21

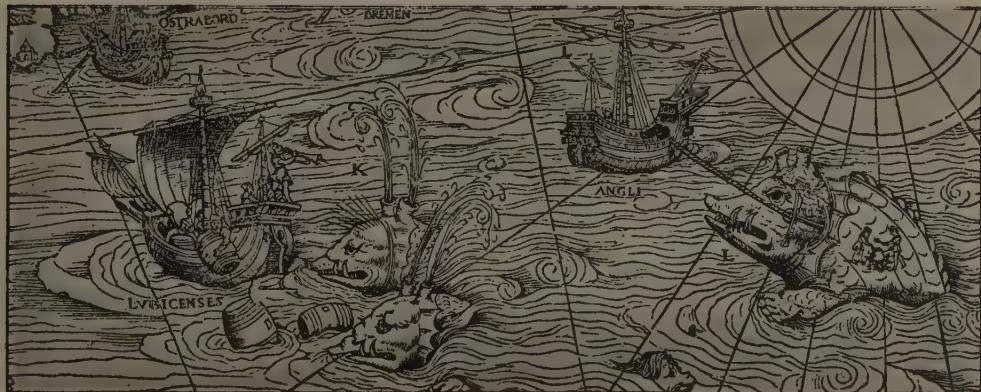
19. Borgian MS. world-map, c. 1450.

The North is at the bottom. East of the Volga are nomad Tartars with their horses and cattle. They made temporary villages of leather tents and wagon covers, and cremated their dead. Below are the warrior women of Livonia, and to the left the mountains of Gog and Magog (Urals), with white summits. Towns are represented by two temples.

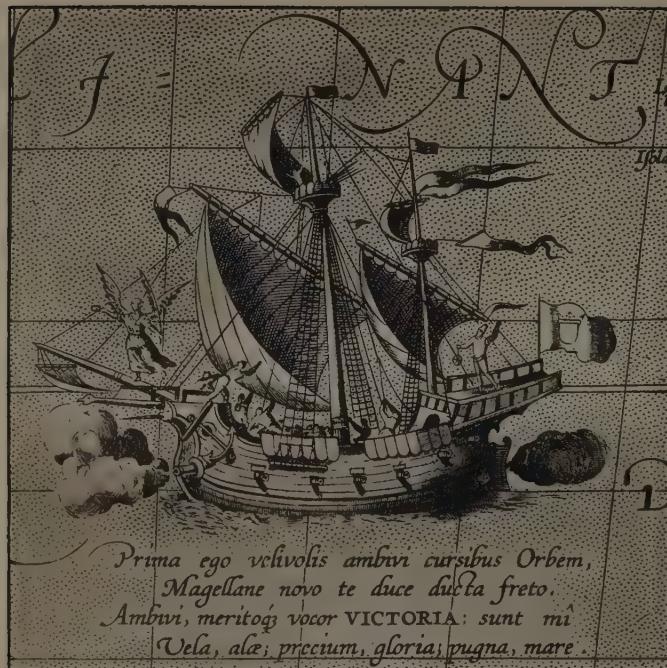
20. From an atlas found in early MSS. of Ptolemy's Cosmographia, as improved and engraved at Rome, 1490. The sugar-loaf mountains, dense leafy forests, circles for towns and the lettering in Roman capitals indicate an early Italian line-engraved map.

21. From a Swedish map woodcut at Venice, 1539. In the sea south of Iceland, it shows the English hungry and glorious, but the Lübeckers sacrificing their beer and playing music to soothe the vicious marine monsters

19



21



22. The Pacific Ocean, by Ortelius, 1592. The ship is the Victoria (greatly idealized), in which Magellan made the first voyage round the world, 1519-22. The enormous flourishing Italic capitals, stippled sea and offshore shading are typical of contemporary Flemish maps.

23. Map of Bavaria, 1579. Every detail, from the stiff pine trees, rounded hills and toy towns to the currents in the Danube and the full-dress battle, is clear and artistic but as unreal as if drawn upon a theatre curtain. The lettering is flourished 'bastard' Italic. The vineyard north of Neu-
burg and the donkey in the fenced pound south of Ingol-
stadt are features usually found only on estate plans

22



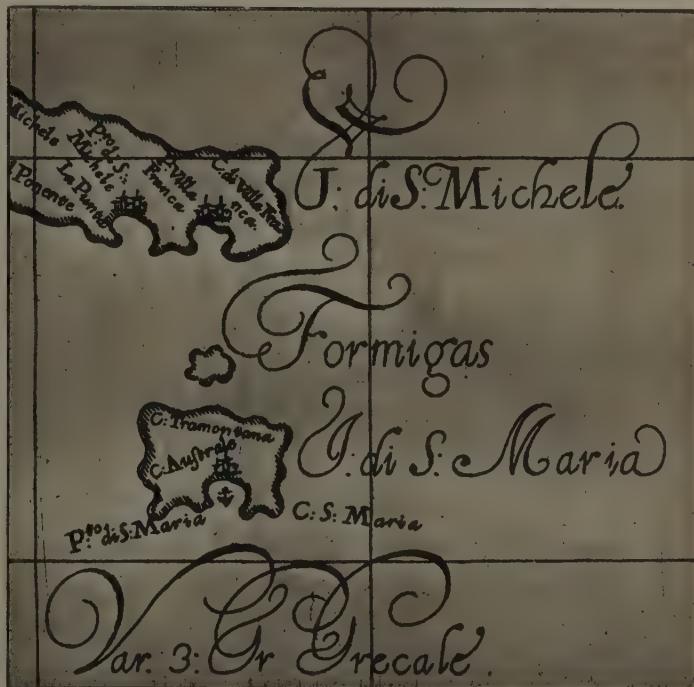
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24. From a map of Kent by Philip Symonson of Rochester, 1596. The larger towns are shown in profile-plan, but these are nevertheless symbols not pictures, though Symonson certainly drew some of the churches representing villages as he saw them. This is one of the earliest English county maps on which roads were marked. The Downs are pleasant, easy slopes, generally shaded on the north-east. The cliffs are turned backwards almost into elevation, and the manner of depicting quayside churches and taverns is that used on contemporary charts for guidance of mariners. The sea is moiré, which would indicate a Flemish refugee as the engraver, though at home the Flemings often favoured a stippled sea (fig. 22). Windmills are numerous here, but water-mills were still much more common in England. Note the castles and gentlemen's mansions. Compare this with fig. 34, showing the same district.

25. The Azores on a maritime atlas by Robert Dudley, son of the Earl of Leicester and pretender to the Dukedom of Northumberland. The atlas was engraved at Florence in 1647. The intricate flourishing capitals are a Latin and later form of those on fig. 22. The sea is blank, the coasts are shaded inwards, the towns are many-towered and in elevation, and anchorages are marked as they already were sixty years earlier and are today



24



25



26. French map of Malta, 1752. Form-lines, like softly ebbing tides, along the coast, towns in plan and vertical hill-shading had become firmly established upon maps. Compare the cultivated lands with those on fig. 12.

27. From a world-map engraved by John Senex, 1721. From about 1570 to c. 1830 allegorical female figures representing the four Continents were often introduced to adorn maps. In the 17th century Dutch map publishers adopted this theme ardently, employing famous engravers upon it. Africa usually wore the skin and tusks of an elephant upon her shoulders; America was a nut-brown maid wearing a costume of brilliant feathers and accompanied by an alligator.

29. Cartouche of a map of Ireland, c. 1793. The conventional females reflect the style of portraits by Gainsborough and Romney. This cartouche also illustrates the great contemporary development in lettering used for maps, for it shows no less than seven different hands. At that time special artists were employed to design the cartouche and others to engrave the inscriptions on it.

26



27



28 Spirited pictures such as this, matching the picaresque novel, occur on many 18th-century road-maps



A Table of Explanation

	A City
	Archbispoppriick
	Bispoppriick
	Deuoroii
	Shire Town
	Corporations
	Market Towns
	Post Towns
	Faire Town
	Cinqueport
	Gentlemans House
	Parish Churches

30

34. From the Ordnance Survey map of Kent, 1819. The shading is too heavy, almost concealing many features. It was lightened at a later date by etching with acid instead of engraving with a burin

30. How overworked the tower symbol had become by 1670 is shown by this 'Explanation' on John Ogilby's map of Kent. The cross and the circle at the end of a staff which project respectively from the market towns and fair towns probably derived from the bough or 'bushel' which used to be hung out from taverns in mediaeval times. After 1670, however, the larger towns were generally shown in plan.

31. From Bowen and Kitchin's Huntingdonshire, c. 1754. It illustrates the fashion of the time in supplying every kind of useful information. The spur over Huntingdon indicates a post stage, the Maltese cross a Charity School, the R. a rectory, the crozier an ancient religious house and the V. a vicarage. The post-roads are dotted down the middle and have distances in miles marked along them. The stars represent Members of Parliament. The map gives an excellent idea of a county town in the days of Tom Jones.

32. This extract from Rocque's Shropshire, 1753, is quite modern in representing churches by plain crosses and mansions in plan. The vertical shading is clumsily engraved, but effective. Rocque has also distinguished arable, pasture and common lands (see fig. 26), and shown hedges along the roads and coal-pits on the hills. These are drawn, of course, larger than the scale of the map ($\frac{1}{8}$ inch = 1 mile).

33. Concerning the interior of Honduras in 1776 even Thomas Jefferys, a great cartographer, could only make guesses. Some of his 'hairy caterpillar' ranges of mountains here are poor guesses while all of them are unnatural mountains. Yet for rumours and legends this exciting symbol served admirably almost down to 1900.

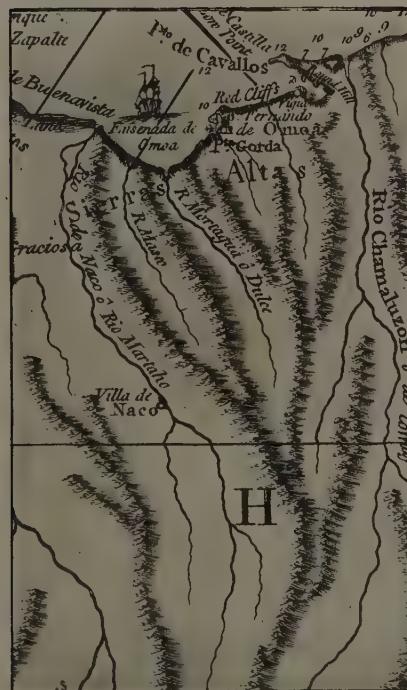
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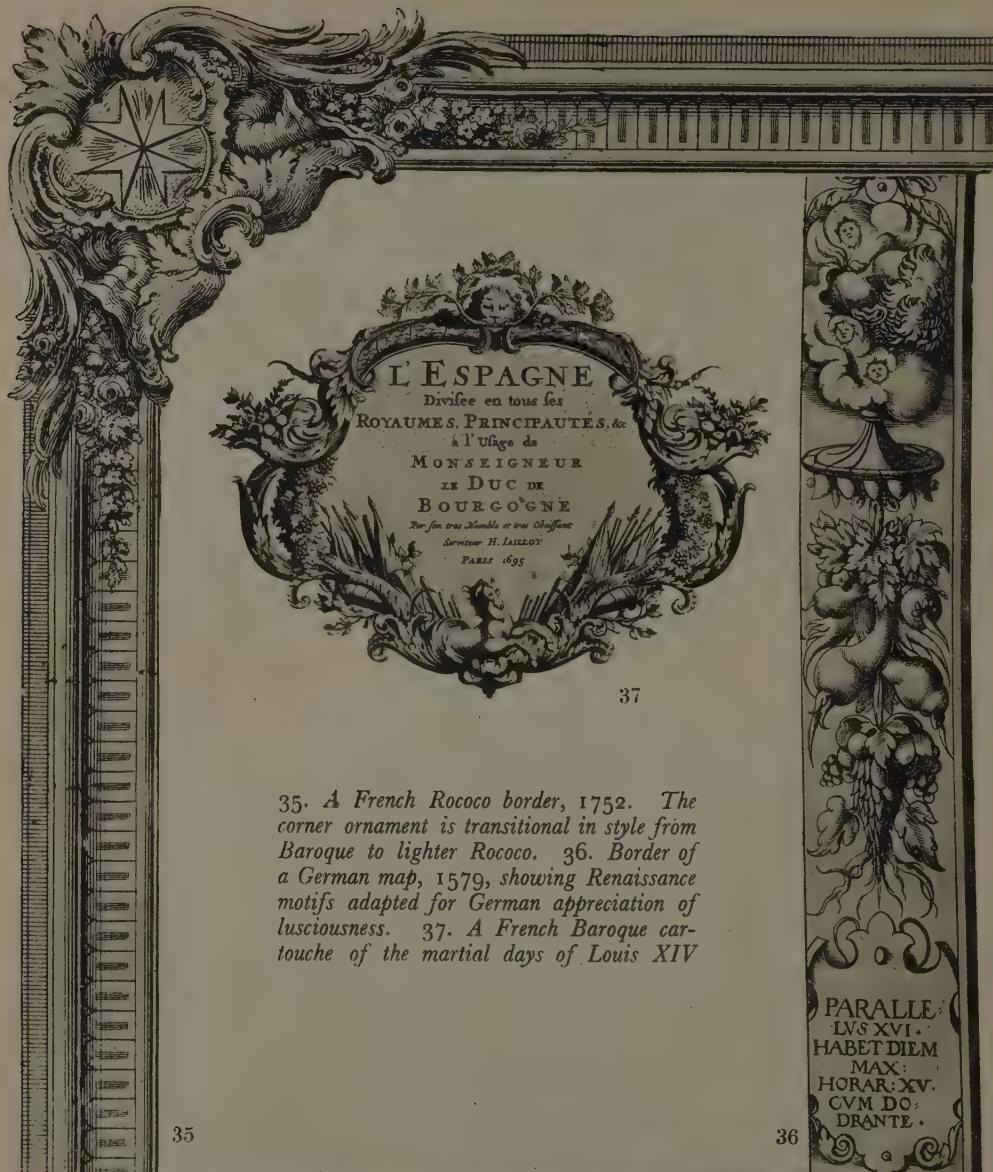
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Long-Range Meteorological Air Reconnaissance

by JACQUES COCHEMÉ

In the December number of this Magazine the President of the Royal Geographical Society mentioned how little we know about conditions in the upper atmosphere, their importance as affecting human environment and communications, and the almost unlimited opportunities that exist for exploration in that field. Flight-Lieutenant Cochemé shows the extent to which one method of exploring it has been developed by the R.A.F. during the war and the promise that this method holds for the future

WHEN the meteorologist tries to forecast, he needs first to decide the nature of the large-scale weather phenomena (such as depressions, fronts, etc.) which are likely to affect the area of his forecast; whether these systems are becoming more active, or less so, at what speed they are moving, and whether their march is being accelerated or retarded. Having done so, he must then consider how these phenomena are going to affect the area he is concerned with, what will be the individual reactions of its topographical details, and what can be gathered from accumulated knowledge of its peculiarities.

For the second part of this task local knowledge is essential. The first part, however, is based on a consideration of successive sets of simultaneous observations over a large area, in other words, an analysis of the synoptic weather chart.

To forecast the weather of the British Isles and North-Western Europe a good deal needs to be known about the recent weather over the sea, the more so because the main weather systems usually come from the west. Before the war synoptic reports from ships were available. When, for security reasons, this source of information disappeared, an urgent need for meteorological air observations arose.

Another reason for carrying out meteorological air reconnaissance is that the weather is a three-dimensional activity taking place in a three-dimensional medium, by contrast with activity on the earth's surface. What is going to happen at the surface is for many purposes the most important consideration, but, so far as flying is concerned, it is obviously not the only one. Furthermore, forecasting based solely on an analysis of surface observations cannot lead one very far. There is, at present, little doubt that further investigation of weather developments in the vertical dimension is necessary for improvement in forecasting technique. During the war im-

portant steps were taken in that direction, and the contribution of met. flights has been considerable.

Aircraft ascents for meteorological purposes were made during the 1914-18 war. Such soundings have been made continuously from various aerodromes in the British Isles since 1925. A very fine standard of continuous operation has been maintained by the Flights charged with this duty. Difficulties of take-off and landing in bad weather, due to the increased speed of the aircraft used nowadays (Hurricanes and Spitfires—formerly biplane fighters), have been compensated by the advance in blind-flying technique and aids from the ground. During the recent war met. climbs were also carried out from many places overseas.

This vertical exploration of the atmosphere has a robot rival—the balloon-borne radio-sonde. Without comparing the relative merits of these two means of measuring pressure, temperature, humidity and height, it is evident that the airborne observer can report visual meteorological observations, such as details of cloud structure, visibility and icing conditions, which cannot be recorded by radio-sonde. Much more could be written about the met. climbs, but it is with long-range meteorological reconnaissance that I am here concerned.

Early in 1941 a few Blenheims, which could not light-heartedly be spared, were allocated for long-range meteorological reconnaissance. They operated over the North Sea and the Atlantic. The observations were normally taken by the navigator. There was, however, a notable exception to this, a meteorologist, who for the occasion became a navigator as well, and did some remarkable pioneer work in meteorological air observation technique.

Besides the navigator-cum-met. observer there were also, of course, a pilot and a wire-

less operator/air gunner. From one of these Blenheims an enemy aircraft was shot down over the North Sea with one fixed .303 Browning machine-gun firing forward. The Blenheims were succeeded by Hudsons, and later by Hampdens.

Meanwhile, amongst the technical staff of the Meteorological Office, there was a growing desire to participate in these flights. Doctors do not deputize others to examine the complexions and tongues of their patients before they diagnose, we felt; and many a forecaster, after briefing aircrews, felt that he would be happier if he were given the chance of a taste of his own medicine, and refreshed by immersing himself in the elements whose behaviour he strove to predict from the ground.

There were some obstacles: shortage of personnel, training, etc.—and in those years of violent and desperate air struggle the emphasis was elsewhere. The step was, however, inevitable, and towards the end of 1942 the decision to create a Meteorological Air Observer Section of the General Duties Branch of the R.A.F.V.R. was duly promulgated. There was no dearth of volunteers within the limitations of age, status and medical fitness imposed.

Early in 1943 training began. Five forecasters were told to report to an Air Gunnery School. They must have thought us an odd lot with our academic approach to the theory of sighting machine-guns in the air: an engineer, a science master, a physicist, a Polish professional meteorologist and a biologist—war-time forecasters. But even book-worms can shoot straight if they understand what they are doing. We all did well although we had an unusually short time in which to learn. After another short spell at a Navigation School, we learnt what was so far available of our own technique from another meteorologist, who had been called up a few months before us. In a little over two months we had joined our several squadrons, at the four corners of the British Isles and in Iceland, and were busy traversing the ever-changing panorama of the weather over the seas. This is probably the shortest training period on record from civilian life to operational flying.

One short course succeeded another, and our numbers grew until by the end of the war about 20 officers and 80 N.C.O.s had been trained. Just before the end of the war the Met. Air Observers were awarded a flying badge of their own, a single wing with an 'M'.

The Hudsons and the Hampdens were

gradually replaced by Venturas, Fortresses and Halifax Mk. II, V and finally III, now the mainstay of meteorological reconnaissance. Some flights were also made in Catalinas, including what is probably the longest meteorological reconnaissance done during the war. We went to 35° West, and made two soundings, one at the terminal point. It took 22 hours 40 minutes. We had eggs and bacon, and steak, chips and onions on the way. We landed on Loch Erne with 60 gallons of petrol and the gauges reading nil. The captain, a man of fine judgment and terrific nervous energy, did a masterful descent through cloud using a Radar beacon. Over the loch the cloud base was 150 feet, and there are a few hills about.

Anti-submarine depth charges were carried, in case of 'trade'. Many of the aircrew would have preferred a more direct way of fighting the enemy. Several were veterans who had already done one or more operational tours in anti-submarine warfare, or bombing. Others were back from long spells of instructing duties in Canada or elsewhere. They got down to the allotted task and carried it out. We had some splendid squadron and flight commanders and crew captains. On only two occasions were sorties cancelled owing to the weather at Tiree during the last year of the European war. In both cases the cause was snow and ice on the runways and a strong cross wind making take-off impossible. This fine record is owed to the exertions of the technical and ground staff who worked under difficult conditions, often in the open air, at night—at Tiree the rain is more nearly horizontal than vertical!

When the need for more met. flights became urgent the United States Air Force lent the support of their excellent equipment and personnel. They began by running one squadron with British meteorological air observers. Meanwhile a batch of American observers was being trained at our training base. Fairly soon the U.S. were training their own observers and by the end of the war their share was substantial.

By that time there was one British squadron in Iceland, one in Gibraltar, and four more British and one American in the British Isles. All these units did a maximum of two routine flights a day with the exception of 518 Squadron, based on the island of Tiree, where we did four. In addition special flights were carried out to meet urgent operational requirements. Many of these 'specials' were flown by 521 Squadron from Norfolk over the southern North Sea.

Let us embark on one of those trips from

STANDARD METEOROLOGICAL AIR RECONNAISSANCE FLIGHTS PERFORMED BY THE R.A.F.

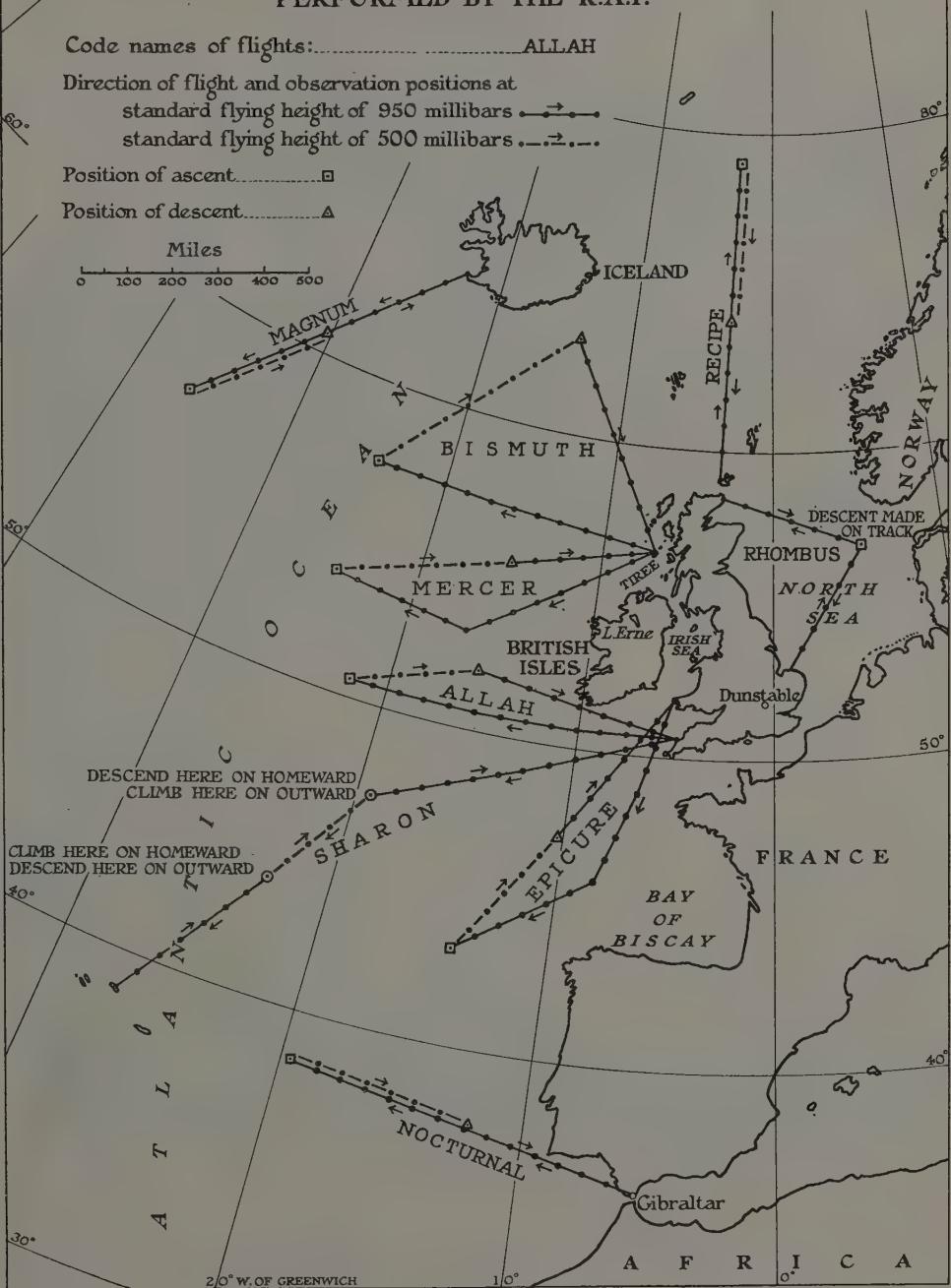
Code names of flights: ALLAH

Direction of flight and observation positions at
standard flying height of 950 millibars →
standard flying height of 500 millibars →...

Position of ascent □

Position of descent △

Miles
0 100 200 300 400 500





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A crew leaving a Halifax Mk. III. In the centre is the first pilot and captain; on his left the navigator carrying a theodolite. The meteorological observer is wearing glasses. All are loaded with life-saving impedimenta. On the aircraft may be seen the transparent nose behind which the meteorological observer sits and a psychrometer carried externally on a bracket

Tiree: a night flight. At about 9 p.m. G.M.T. the Duty Officer calls the crew, who slip on the aircrew underwear. In the Halifax, besides the met. observer, the crew is composed of two pilots, one navigator, one flight engineer, and three wireless operators/air gunners. It is the job of these seven men to take the met. observer where he needs to go, and in the approved manner, and to ensure that his messages are satisfactorily transmitted. This exacting task involves long hours of flying, often blind, and in all sorts of weather, when the accuracy of the navigation needs to be not merely superlative but also continuously superlative.

Meanwhile our eight men, clad for the occasion, and somewhat to their fancy, have an aircrew meal. The menu is rigid and traditional: heavily fried things, steaks, chips, eggs, etc., rich in calories but making a well-sprung stomach essential; and lashings of strong tea. . . .

On most war-time airfields things are

widely dispersed, and in between the various stages of the pre-flight evolutions, one clambers in and out of a transport vehicle. First comes briefing in the Operations block by the Met., Operations, Signals, Intelligence and Duty Officers. Then comes a visit to the safety equipment section to collect the various life-saving impedimenta—things that are supposed to make one float down or up as the need dictates. Next to the Flying Control tower; and finally, in about 100 minutes after the call, the crew are in the aircraft sorting out their goods and chattels.

The met. observer goes to his pitch in the tip of the nose to check his instruments. A bark stretches into a snarl and the permeating noise and trepidation begin. One by one the engines are started. They are run and tested, their disposition is spread on the physiognomy of numerous dials which three men scrutinize. The remaining four (whom the met. observer now joins) go and sit in the rest compartment, between the main spars,

The Halifax is taxied to the runway with outbursts of engine power and screeching of brakes to keep her straight.

She rolls away on her take-off run. In the rest position, all you can see in the dim light is the queer perspective of the vibrating hull. But you can hear and feel changes in motion: hear the four Hercules in fine pitch very soon giving voice to their full power; feel the powerful acceleration as they greedily chew up the air; feel the quick slight changes in direction as the captain, with tense thighs, lines up his race with the flare-path; feel the wheels bumping and the sudden smoothness of being airborne, and the heaviness in the body of beginning to climb.

"Okay to come forward," says the captain as, with a sense of relief, the power is decreased. The met. observer and the navigator crawl forward underneath the second pilot's seat to the nose.

The met. observer settles down. Below him, through the perspex, the lights of the airfield are slowly gyrating and shrinking as the aircraft makes a climbing turn. He switches on the light and spreads out his tools, logs and tables, scales and charts, watching the aneroid barometer out of the corner of his eye. "Met. to pilot, 200 feet to go, 100, steady at 950 millibars." That is the flying level of the horizontal leg. When, owing to the surface pressure, that level is much higher or lower than its average, say 1800 feet, another more suitable level is chosen.

The met. man switches off the light and squares himself up in his seat for this fast exploration of a changing panorama in the dark. His night vision slowly asserts itself like a gradual understanding. If there is no moon, and total cloud, to cut out starlight, he will find it very difficult to decide what the nature of the cloud is and the height of its



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At his post in the nose of a Halifax sits a Sergeant Meteorological Air Observer. He is looking at instruments on the starboard side, hidden by curtains arranged so as to cut off light from the navigator's compartment at night. In the transparent perspex, through which observations are taken, is a hole for a machine-gun, now plugged



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Condensation trails were of interest in war-time from an operational as well as a meteorological standpoint, since they revealed the presence of aircraft otherwise invisible. To avoid this, the met. observers could advise aircraft of levels where 'contrails' would not form. Here, looking back from a Halifax at over 18,000 feet, several are seen, the larger formed by the four engines and the smaller by the wing tips. (Opposite) Fair-weather cumulus and strato-cumulus, from above

base. But if there is only a thin layer, with softly undulating top, to be climbed through with a quick glance at the aneroid for its levels, and above that moonlight and smooth air, he may give way to the beauty of the scene, and, to put it simply, 'feel fine' as he sits in the nose of the aircraft looking at what confronts him and forgetting all else.

There are less peaceful initial sights such as awe-inspiring wintry showers with violent turbulence. Of these, the best that can be said is that they are 'interesting'.

"Navigator to met. ETA Position 1, 00°15." There is a position every 50 nautical miles where a full observation is done. Before arriving there the observer has already decided what information he can gather through his eyes: cloud formation and amount,

visibility, type and amount of precipitation, etc. He now switches on the light as dim as possible in order not to contract his pupils too much, and reads his instruments for air speed, pressure, temperature, humidity, etc. Certain corrections have then to be made; such as allowing for the heating of the thermometers by the airflow. It all goes down on the log as a set of collected data, equivalent to that recorded at a land meteorological station.

The observations are translated into a numerical code, and, of course, during the war the message was enciphered before being transmitted. The code now used is international, and the messages are in clear. Anyone can tune in to a stream of groups of five figures describing in a beautifully concise

way the weather over the Atlantic.

"Met. to pilot. About to take some readings." Another position is reached and the pilot carefully flies her at constant height and speed. Every third or fourth position the aircraft goes down as near to the sea as possible to make some additional observations and determine the barometric pressure at the surface. Let us assume good conditions: a fine well-lit night with a gentle swell. "Going down now," says the pilot, as he puts the Halifax into a gentle glide. The second pilot calls out the heights: "400 feet . . . 350 . . . 300 . . . 250 . . . 200"—that is as far as we are going tonight. "180 . . . 200 . . . 200 . . . 200."

The met. observer taps his aneroid and gently adjusts the subscale of his altimeter. He also reads the temperatures of his psychrometer.

"180 . . . 230 . . . 200 . . . 200 . . ." "Met. to pilot. Take her up," and his pencil is pressed against the paper as the pilot puts her nose up and increases the revs.

It is sometimes not without a certain feeling

of relief that one sees the end of an observation near the sea surface. Conditions can be very turbulent and rough at that height and, in any case, the Atlantic at two o'clock in the morning is not the place one would choose to indulge in low flying for fun. With a heavy aircraft like a Halifax, 50 feet is as far down as most people will venture in daylight, and with reasonable conditions. One does, of course, come across the exceptional type of pilot, in this game as in any other.

A great deal of weather is, in that way, crossed in a few hours, at the modest speed of 200 miles per hour, and at the convenient level of 950 millibars, with little excursions in the vertical to determine such things as the height of the cloud base.

At the end of this first leg comes the climb of about 17,000 feet to 500 millibars pressure level. This means a busy time for the met. observer, and an exacting task of handling and engine control manipulation for the pilots. It starts off with another set of observations near the sea surface, after which the aircraft climbs steadily over a small area,

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Thunder-clouds—cumulo-nimbus, with an anvil cirrus top: very turbulent inside, where ice formation, shower-squalls and other unpleasantness await aircraft bound by duty to climb through them

levelling at intervals of 50 millibars for the recording of temperature and humidity. The speed must be steady throughout and the amount of power needed is therefore varying the whole time.

The met. man must also observe the levels of the clouds, their amount and nature; the levels of the various forms of precipitation: rain, drizzle, frozen rain, hail, snow, etc.; the levels of the formation of ice on the aircraft, etc. etc.

"200 feet to go . . . level her . . . take her up." Step by step the Halifax climbs. Half-way up somebody says: "Oxygen on." An oxygen mask, however essential, is not the best sort of thing to have in front of one's face when one is busy, looking at scales, coding, computing, taking notes. The other members of the crew help the met. observer with the outside observations, as, during the climb, he is looking down his mask a good deal of the time. He computes, with the data obtained, the absolute heights of different pressure levels. This valuable information is used for the study and forecasting of the

movements of the air at various heights, and is of paramount importance in meteorology and in air navigation too. Upper winds of 100 to 150 knots are not uncommon and will soon blow an aircraft hundreds of miles off course.

Climbs are frequently made in cloud. No one likes to climb in a large turbulent thunder cloud, or cumulo-nimbus, however interesting the experience may be from a met. point of view. Fortunately it does not happen very often.

"200 feet to go . . . level her for the top, 500 millibars." At that pressure the height varies between 18,000 and 19,000 feet and the air is half the density at the surface. The second leg of the triangular journey is flown at that height. The air temperature may be anything between zero and -70 degrees Fahrenheit. If there is no cloud at that height, and no cloud landmarks to be seen below, all feeling of motion is lost, and one is suspended in mid-air, a small centre of noise over the sea.

The rising of the sun can be a very fine



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A peaceful scene from the 'top leg' (500 millibars: 18,000-19,000 feet), showing strato-cumulus cloud without 'landmarks'. "All feeling of motion is lost, and one is suspended in mid-air"

thing to watch from the top leg; and a very fine thing it is to feel it happening: gradually to see more things, and better, and to feel through the perspex the first promise of warmth on one's dirty hands.

The descent is very much like the ascent, and is welcomed, even though it often means going through and below cloud, away from the sun. After the descent the last leg home is flown, again at 950 millibars. The sortie comprises in all some 26 observing positions and two soundings; about nine and a half hours' flying to collect the weather data over an area as wide as the British Isles. It ends up with more passive sitting in the rest compartment whilst the large machine is landed.

There is more collecting and dragging about of wares and life-saving equipment and empty tin sandwich-boxes, more jumping in and out of lorries by men with beards and too many clothes. The met. observer is debriefed and interrogated in the Met. Office. His log is checked against the messages he has sent during the flight. The complete coded report is then passed on to Dunstable, the Central

Forecasting Station. From there, like the previous wireless messages, the final and corrected version is broadcast by teleprinter to all the meteorological offices in the British Isles and by radio to met. centres overseas. Soon afterwards the results obtained on the sortie appear simultaneously on the synoptic charts of these places. By that time the met. observer has had another heavy fried meal, and, by rights, should be in bed.

Most things have a price, and some met. observers have paid with their lives for their curiosity, or restlessness, or whatever the commendable impulse was which made them take on that job at a time when they were already usefully employed in a reserved occupation.

Of the first course of five that I mentioned earlier, three are left. This is perhaps not a bad percentage, considering the odds some people had to face during the war. Apart from the hazards normally associated in service flying with men and machines, there has been a certain amount of enemy action in the Bay of Biscay and over the North Sea.

But the chief enemy has been the weather; the weather which has tried to bungle take-offs, or deny us somewhere to land (met. aircraft have been diverted as far as North-West Africa), tried to force aircraft down with icing, strike them with lightning, or buffet them to bits in squalls.

There have also been some wonderful rescues. A Halifax was forced down in the Atlantic 700 nautical miles south-west of its base in Wales. Two days later, the captain and first pilot of another met. Halifax spotted the entire crew in a rubber dinghy. They were subsequently rescued by a ship and taken to America.

* * *

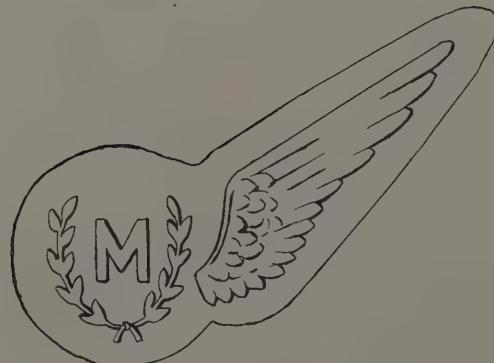
What is the future of meteorological air reconnaissance in the present attempt at scientific international planning and goodwill?

During the war there were two main aspects, the operational aspect and the synoptic aspect. The information made available by met. reconnaissance flights over the Atlantic, for example, was essential to the maintenance of delivery and transport services. In addition there were arrangements for reconnaissances by fast, high-flying Mosquito aircraft over enemy territory, as a preliminary to every important offensive

operation. While however the flights were of major importance for specific operations, their utility did not end there. They supplied the forecast service with vital information required for the general purposes of forecasting—information that could not be obtained by any other method.

The pre-war scheme of obtaining reports from the oceans with the voluntary cooperation of the Merchant Navy has been reinstated, but the need for meteorological reconnaissance flights remains in this era of rapidly increasing air transport. With international cooperation, the work could be shared out and a vast network built up, and very valuable data accumulated. Such flights would also provide a means of training service pilots in all-weather flying, and of making it possible for forecasters to draw on their memory to stimulate the mind's eye when attempting to describe features of the upper air.

By obstinate endeavour and hard work, this country now occupies a position of supremacy in the field of meteorological air reconnaissance; and with the reduction of the priorities which other flying activities have held, for example in instrument design, a great future is open for both pure and applied research in that field, in such directions as the exploration of the polar air routes.



Potosí



Buttress arches of the Mint at Potosí

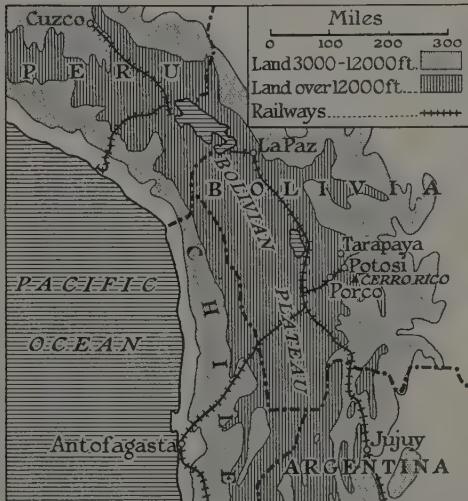
by THOMAS LLOYD

In the heart of the Bolivian Andes, at an altitude of over 13,000 feet lies one of the highest and most interesting cities in the world—historic Potosí dominated by the famous hill, the Cerro Rico, which rises in a conical form to a height of 2800 feet above the town. From this hill was mined the silver which at one time made the name Potosí a synonym for fabulous riches. This, however, did not deter a very forlorn poet from gallantly offering the hill, with the perfumes of Arabia thrown in besides, in exchange for a 'yes' from the lips of his beloved:

*Te diera, si me dieras
De tu linda boca un si,
Las aromas de Arabia,
El Cerro de Potosí.*

(I would give thee, shouldst thou
Give me a 'yes' from thy lovely lips,
The perfumes of Arabia,
The Hill of Potosí.)

At the end of the 16th and beginning of the 17th centuries, Potosí was perhaps the most populous city in the New World, with a population estimated to have been around 150,000. With the fall in the value of silver and the exhaustion of the silver veins, the city fell on evil days, and its population became reduced



at one time to about 8000 souls. However, of late years the mining of the tin resources of the wonderful hill has brought a little prosperity back to the place which at present has a population of about 40,000.



Thomas Lloyd

Part of the main square of Potosí, with the statue of the city's reputed founder, Don Juan de Villarroel Santandía. In the background rises the famous Cerro Rico, to the discovery of whose riches in 1545 a llama, still abundant as ever in the region, made an accidental contribution

Thomas Lloyd



The tales surrounding the discovery of the hill's wealth of ore are very attractive. One story says that the famous Inca monarch, Huayna Capac, when 'taking the waters' at nearby Tarapaya where there are hot springs, heard his followers speak of the *Sumaj Orcko* (Beautiful Hill) and decided to go and have a look at it. From Kantumarca, a village in the valley right below present-day Potosí, he got a fine view of the beautiful conical mountain, and the variety of colours in its rocks led him to the conclusion that therein might be contained much wealth with which to adorn his palaces and temples in Cuzco. At Porco, not far away, silver was already being mined, and so he ordered miners to go from there to make an investigation of the ore possibilities of the *Sumaj Orcko*. When these miners started digging into the hill's flanks, there was a tremendous noise like a thunder-clap and a voice which said in the Quechua tongue, "Mana kancunapajcgu; Pachacamaj janajpachapaj huakaichan." ("This is not for you; God is reserving this wealth for those who come from afar.") The terrified miners fled and reported their experience to the Inca who decided to respect the voice and to desist from further mining activities in that direction. He, however, changed the hill's name to that of *Potojsi*—the Quechua word for great noise, thunder—the word having been so often repeated by the miners in describing what had happened to them. A more prosaic explanation of the etymology of Potosí is that it is a corruption of the Quechua word *Potojchi*, said to mean "Source or fountain of silver"—certainly a very plausible explanation.

The story of the actual discovery of the hill's riches by an Indian, about a century



Thomas Lloyd

Preserving much of the Spanish colonial atmosphere, the streets of Potosí are frequented by traffic familiar in the Andes before the Spanish conquest

later, after the arrival of the Spaniards, would appear to be a well-established one. This Indian—even his name, Huallpa, is recorded—reached the hill from Porco in search of a stray llama and had to spend a night there. To keep himself warm at that freezing altitude he lit a fire. In the morning he noticed a white thread of molten metal where the fire had been and mentioned his discovery on his return to Porco, with the result that in April



Thomas Lloyd

During four centuries the 'Indian' peasantry, industrious cultivators of the Inca Empire, have bartered produce for the wealth extracted by their fellows, under Spanish direction, from the mines—



Armando Alba

—and represented by the massive 18th-century Mint of Potosí, now being restored partly as a museum



A carved pulpit in the Jerusalem Church; one of many treasures recalling the heyday of Potosí

1545 the first level was opened in the hill and the first houses of the city built.

The Emperor Charles V, in recognition of the vast treasure that the Spanish crown received from this source, gave the city the title of Villa Imperial and a coat-of-arms with the following inscription, "Soy el rico Potosí, del mundo soy el tesoro, soy el rey de los montes y envidia soy de los reyes". ("I am the rich Potosí, of the world am I the treasure, I am king of the mountains, and envy am I of kings.")

While the city is still rich in the remains of its former splendour, such as churches and houses constructed in the days of its prime, perhaps the most interesting building in the place is the Mint, the *Casa de Moneda*, which was begun in the year 1753 and only finished twenty years later. It is an enormous structure, massively built of stone and brick, and cost so much, even in those days of practically slave labour, that Charles III is said to have sarcastically inquired whether the building had been constructed of silver. The original wooden minting machinery, made of Spanish chestnut and brought out from Spain, is still intact, and probably could be operated today. As the cogs of the driving wheels wore away very rapidly with use, these came to be made of the hardest wood obtain-

able—quebracho, which grows in the northern part of what is today the Argentine Republic. The Mint, however, also possesses more modern minting machinery and metal coinage is at present being produced.

Some excellent restoration work, under the wise direction of Señor Armando Alba, President of the Geographical and Historical Society of Potosí, has recently been carried out, and now it is possible to see the building as it was in the days of its glory, before it was degraded into barracks, stables and what-not, and its beautiful stone and brick-work hidden, first by whitewash and then by grime. Work has also begun to turn part of the mint into a museum in which to house the treasures of old Potosí, and Señor Alba has already got together quite a collection of interesting colonial paintings and has salvaged the wealth of old manuscripts that lay neglected in various corners. These he has had either bound or put away in cardboard boxes, indexed and catalogued. He is also forming a reference library of modern works, largely dealing with engineering, mining and scientific matters, for the benefit of university students.

Up in the hills behind the city there is a series of inter-connected artificial lakes, this being the ingenious method worked out by the Spaniards for ensuring an ample water supply for their mining activities, as well as for the town itself. At one time there existed 32 of these lakes—truly a vast undertaking, said to have taken forty-seven years to complete—but at present only about 20 remain. The highest of these lakes are about 16,000 feet above sea-level.

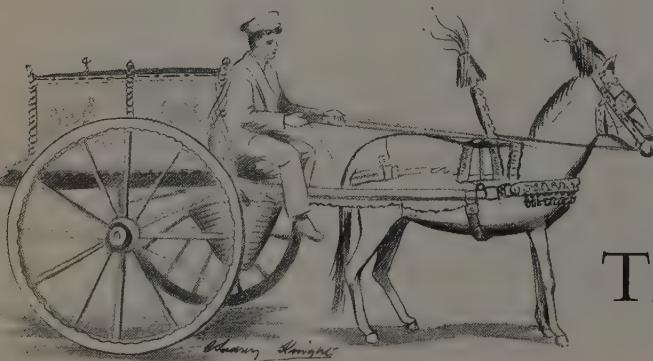
Last year, the city celebrated the four hundredth anniversary of its foundation, and in this connection the 'city fathers' are wisely trying to plan for the future. The local mineral wealth tends to decrease, and a fall in the world price of tin would almost paralyse local operations. Hence the project is to find new sources of wealth in tourists—to give publicity to the old-world interest and attractions of Potosí—to provide modern accommodation for visitors, while preserving the Spanish colonial atmosphere of the city. To improve accessibility an airport is to be constructed, as near the city as the very uneven local topography will permit, with a good road therefrom to the town. At present the only means of communication with the place is by rail, with a far from satisfactory train service. The branch railway which links Potosí with the main Antofagasta-La Paz line is possibly the highest passenger railway in the world, reaching at one point an altitude of 15,700 feet above sea-level.



Photographs by A. Costa

This painter has drawn his inspiration from a story of the Crusades

The mule or donkey also comes in for his share of decoration for, on feast days, he is arrayed with plumes and a velvet harness decorated profusely with tinkling bells and glittering sequins



The Painted Cart

These painted carts in yellow, red, blue or other vivid colours, with their gaudy pictures, are one of the traditional features still to be seen in Sicily. They are mostly owned by itinerant vendors (though sometimes by rich farmers as well) and are handed down through generations from father to son.

The cart is a comparatively light, two-wheeled conveyance made of oak, elaborately ornate, with carved figures of saints and angels and hammered iron-work. It has two fixed topsides but the panels at the front and rear are movable. The wheels, owing to the bad condition of many of the country roads, need to be of exceptional height, but are decorated with as much care as the rest of the vehicle. A mule or donkey is used to draw the cart and an exhilarating speed can be attained should the driver decide to make the beast gallop. The capacity of the box-like contrivance—about 4 or 5 feet square—is amazing and almost everything from sulphur, fruit, wine, coal and manure to human beings is carried.

The Sicilian carts represent a tradition of craftsmanship that has decayed elsewhere in modern mechanised Europe and it was a strange sight indeed to see them during the invasion of Italy all mixed up with tanks and guns. Perhaps the most striking feature of the carts is the vivid paintings which decorate the topsides and rear, within and without. From Sicilian prints dating from the 17th century to the present day it can be seen that the style of these paintings has hardly changed. The subjects, however, vary considerably and the painters are very tolerant in the grouping of widely diverging subjects; operatic scenes jog along in company with historical ones, while political figures ranging from Garibaldi to Mussolini have received recognition and are found side by side with pictures of the Holy Family

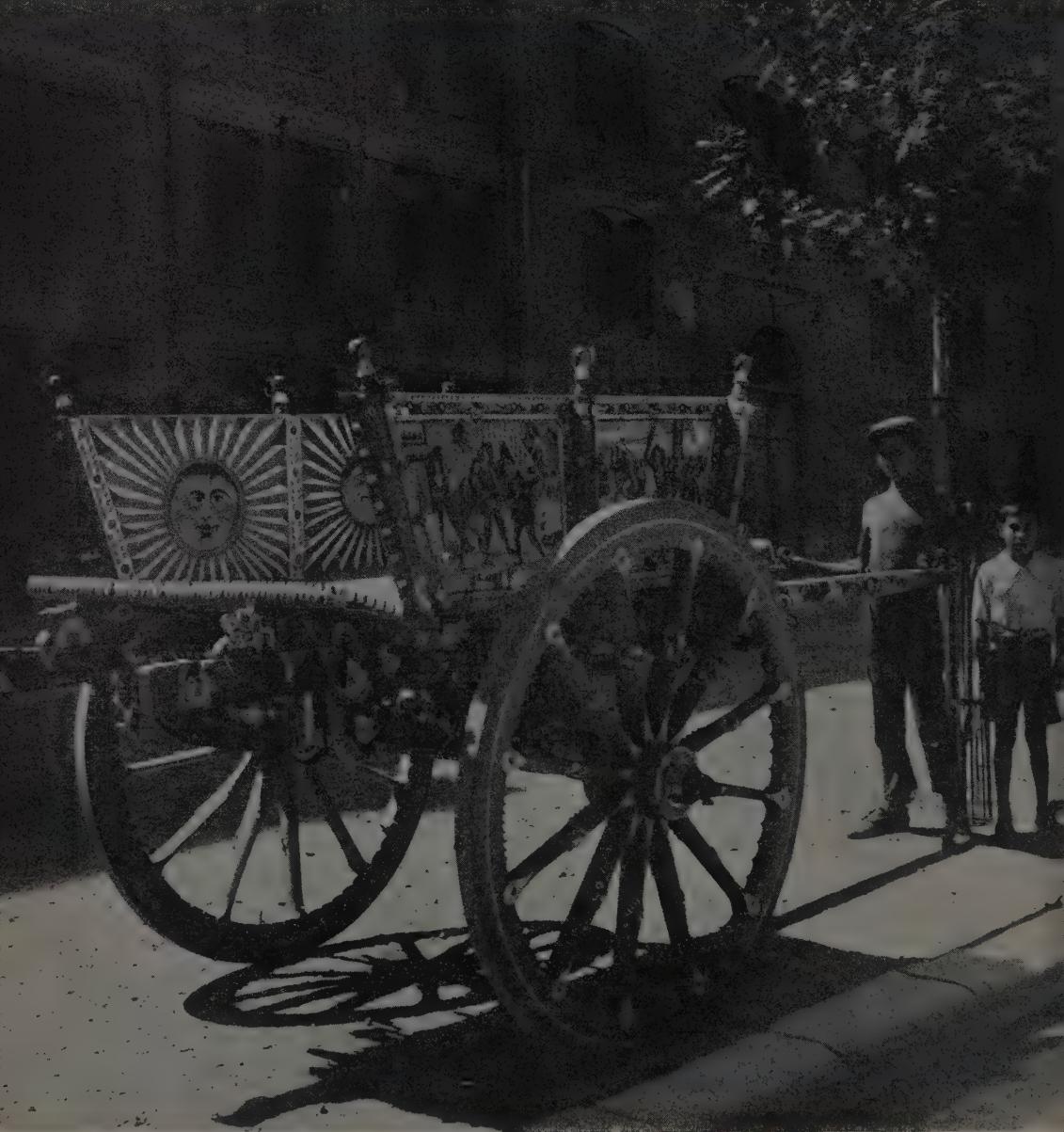


Entire families are employed in painting the carts

A specialist in carving and decorating the wheels



of Sicily



*The owner's son has come to collect his cart and proudly he will take it home for all
and sundry to admire, while its lustre is yet unmarred by heavy work and dirty loads*

Charcoal Burning

by J. MOREWOOD DOWSETT

To the average person, mention of charcoal burning conjures up the fairy tales of childhood's days. The poor charcoal burner's hut in the depths of a vast forest was so often the starting point of adventures in which the hero won fame, fortune and the hand of a king's daughter, with whom he "lived happily ever afterwards".

Turning to a more unromantic aspect, we find that although charcoal is needed in ever-increasing quantities by various British industries, we have to import almost our entire supply of this material. There was once a time when charcoal burners were busy in many English forests, but, unfortunately, most of these forests have disappeared or been sadly reduced in size.

From the very earliest times, charcoal was used to smelt iron. The first iron swords and spears came to Britain from Gaul, but iron mines were worked in the Severn valley before the Romans came. In Roman Britain, the iron mining industry was located in the Forest of Dean and parts of Herefordshire and Monmouthshire. The Saxons neglected the iron deposits they found in England and were content to import this metal, but under the Norman kings more progress was made, and when at last we come to the Tudor dynasty, we find a vast smelting industry in Sussex and adjoining parts of Kent, Surrey and Hampshire, where the dense forest belt, known as the Andread's Weald, between the North and South Downs, seemed to offer an inexhaustible supply of charcoal timber for the iron furnaces smelting the ore found abundantly in Sussex.

The charcoal burner of Tudor England was known as a 'collier'. His occupation was necessarily as lonely a one as it is depicted in the fairy tales, because he had to be always near his furnace in the forest when operations were in full swing, so that he could give it the necessary attention.

There are various ways of preparing charcoal. In China it is made in pits, preferably in a clay soil. In some parts of Sweden rectangular piles of wood are built up, combustion being regulated by the admission of air through holes in the covering. But the most common method would seem to be the erection of cone-shaped piles of billets, about 12 feet high, with a diameter of from 10 to 40 feet. The wood is generally cut in winter and

must be tolerably dry; the heap is built up with the bark outermost, the largest billets being placed in the centre. It is then coated with turf or charcoal dust (breeze) and soil. Sometimes a portable hood of wood, coated with a mixture of loam and grass, is used to cover the heap, in which case charcoal dust is interspersed between the layers of billets, in order to reduce the combustion effect on the hood. This charcoal dust must be kept as dry as possible, and it is better to dispense with it if it is really damp.

The heap must have a central hole or chimney; its sides also contain a number of air channels, the number, location and size of which are a matter of some importance.

The heap is generally fired from the top, by the insertion of glowing charcoal and firewood in the central opening. Another method involves a horizontal gallery, so that firing can be effected from the side. Again, the heap may be fired simultaneously from top and sides, in which case the charcoal in a half-burnt heap will resemble an inverted cone.

The first process, known as 'sweating', may last several days, during which the outer covering becomes saturated with condensed moisture. The central opening has to be stopped up about an hour or two after firing. The air inlets at the base of the pile are closed as soon as the 'sweating' is over and others are then made about half-way from the top; these are closed as soon as smoke ceases to emerge from them, and other series of holes are made elsewhere, as required. The tar products which collect towards the close of the operation are removed through gutters or pipes. Sometimes the base of the head constitutes a flat funnel, provided with an outlet for tar and acids.

The carbonization process is continued layer by layer, and may be termed complete when the heap is an incandescent mass which emits no smoke. A transparent bluish gas will emerge for a while; then the heap can be allowed to cool.

From the above description, it is easy to imagine the hard, lonely life the old charcoal burner led. There could be no set rules for the time at which he could do this or that; so long as the burning process continued, he had to live in a hut in the forest, in order to be ready at any time of the day or night to make



The Times

Having built his heap in three layers of billets, the charcoal burner makes its outer covering. Here we see him putting on the outer coating of 'breeze' over an inner one of grass and loam

adjustments by stopping up holes or opening new ones whenever changes of wind or weather made it necessary. Only experience gained by constant observation could teach him how to do the right thing at the right moment.

Up to the war of 1914-18, the old-fashioned charcoal burner and his hut were still to be found in the New Forest, where charcoal burning was probably the oldest forest industry. When William Rufus met his death

in the New Forest, his body is said to have been conveyed to Winchester for burial in the cart of a charcoal burner named Purkess. Charcoal burning was a hereditary craft of the Purkess family, and men of that name were still practising it in the New Forest at the close of the last century.

Another reason for the charcoal burner's isolation was the unpleasant odour arising from his burning heaps. Thus, in 1607, we find that the town of Stansted was greatly



G. W. W. Stevens

The 'sweating' begins. The charcoal burner will climb the ladder to dress the top with 'litter', such as waste straw, to exclude air and thus ensure even carbonization. Sweating lasts several days

annoyed by the "makeinge of wode", so that not only the inhabitants but also strangers were compelled to "stope their nosses as they go bye, the stinke is so greate". Yet in 1568 a certain Grimes, one of twenty colliers in Croydon, won the right in a court of law to carry on his trade, his opponent being the Archbishop of Canterbury, who complained of the nuisance caused by the smoke and stench to his palace at Croydon. Grimes and his fellow colliers obtained their charcoal from

the thickly wooded area extending from Norwood and Dulwich via Sydenham and Penge to Croydon.

Surrey developed into England's 'Black Country' in the 16th century. Its iron industry was probably started by ironmasters from Sussex, who thought they had an inexhaustible supply of wood for charcoal there. Complaints about the smoke and the waste of timber multiplied, and eventually Queen Elizabeth became so alarmed about a possible



G. W. W. Stevens

The 'keeling in' or internal cooling process. The burners remove the litter with special wooden rakes. Then they will quench the fire with water and reseal the heap in order to keep in the steam

shortage of timber for shipbuilding that she issued decrees to check its use by iron-works. One forbade the erection of iron-works except on former sites and when the owner could provide the charcoal from his own property, while another prohibited the felling of trees with a breadth of one foot at the stub for charcoal.

Yet the iron industry continued to thrive; at the beginning of the 18th century there were about 1700 furnaces in Surrey, Sussex and the Forest of Dean. Two loads of timber were needed for each load of charcoal, and

two loads of charcoal to smelt a ton of iron. An average charcoal furnace produced about 300 tons a year, and by the middle of the 18th century the destruction of the forests caused such a shortage of fuel that more and more pig-iron had to be imported to supply a growing need. Then the discovery that coke and coal could be used to smelt iron revolutionized the industry, which migrated to South Wales, the Midlands and the North, where pit coal was plentiful and cheap.

The gunpowder mills in Surrey owed their existence to the county's abundance of timber



C. W. W. Stevens

On the following day, the heap is finally opened and the carbonized billets spread out to complete their cooling. Any billets found still glowing must be quenched by plunging them into water or sand

for charcoal, which is one of the three main ingredients of gunpowder. But it was found better to prepare this charcoal in large cylinders or retorts, where a more economical product, free from grit and earthy matter, could be obtained. A light spongy wood, containing only a small proportion of mineral substances, makes the best gunpowder charcoal; it should be sound and of not more than ten years' growth. Dogwood (alder-buckthorn) has always been favoured. The wood should be cut in spring, so that the bark peels easily, and stacked for about three years to

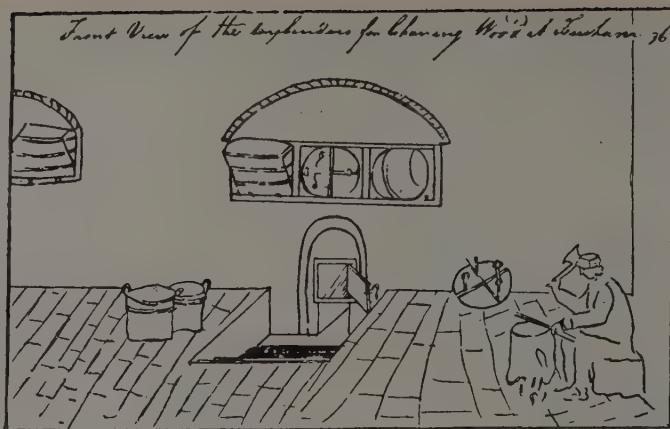
season. The wood used for the charcoal of the old-fashioned black gunpowder was cut into three-foot lengths, which were packed in iron cylindrical cases known as 'slips'. These were inserted in retorts built into a wall, where they were arranged in sets of three over a furnace. An opening into the rear of the 'slip', corresponding with another in the retort, permitted inflammable gases, generated by the charring, to be carried into the furnace, where they were consumed, while other pipes removed the tar and pyrolygneous acid. When the blue colour of the gas flame,

indicating carbonic oxide, showed the wood to be sufficiently charred, the 'slip' was withdrawn and placed in a cooler, provided with a close-fitting lid, for several hours. When cool, the charcoal was stored for about a fortnight before grinding, to avoid the danger of spontaneous combustion.

Properly made gunpowder charcoal was jet black in hue; when broken, it showed a clear velvety surface. The grinding mill generally resembled a huge coffee mill, from which the pulverized charcoal passed into a 'reel' or cylindrical frame, covered with copper wire cloth, of about 32 meshes to an inch. The material fine enough to pass through this fell into a bin, while the coarser particles were collected for regrinding.

Although gunpowder has lost its original pride of place as an explosive for military and mining purposes, charcoal is still needed because it figures largely as an ingredient in many substances devised by modern chemistry. But the old charcoal burner has almost disappeared and the charcoal has to be imported, for although there is an ample supply of waste timber (or was before the last war), modern youth refuses to take up a rural craft involving such a hard solitary life.

The old charcoal burner of romance will never return, but before the last war the Forest Products Research Laboratory of the Department of Scientific and Industrial Research was impelled by inquiries received from industrial concerns to carry out tests on various kinds of timber, with a view to ascertaining their suitability for the revival of a British charcoal industry. In order to overcome the reluctance of workers to take up charcoal burning for a livelihood, several types of portable kilns were tried out. One of



Two views of the retorts in an explosives factory at Faversham, 1798. Charcoal for black gunpowder was made in special furnaces

these, which was tested in the New Forest under the auspices of the Forestry Commission, burns a far smaller quantity of charcoal than that made by the old charcoal burner in his pit or hearth, but it does not require constant attention, so that the man in charge of it need not forgo the amenities of modern civilization.

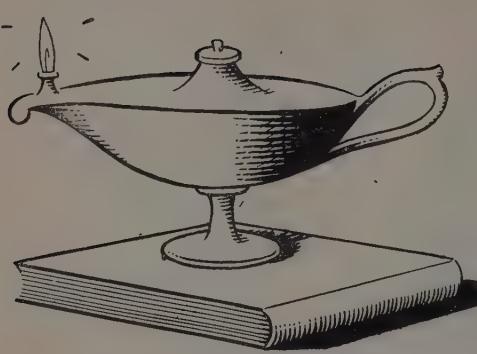
Unfortunately, by its inevitable encroachments on the supply of home-grown timber, the war has undone most of the Forestry Commission's efforts to restore our attenuated British woodlands. Of these, there will be a great national need for other purposes besides charcoal burning, and we can only hope they will not be overlooked when the time for reconstruction comes.



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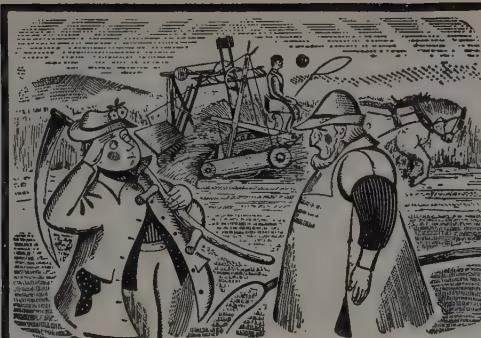
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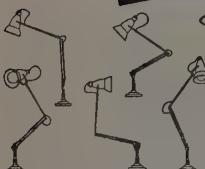
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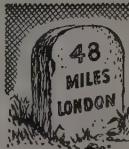
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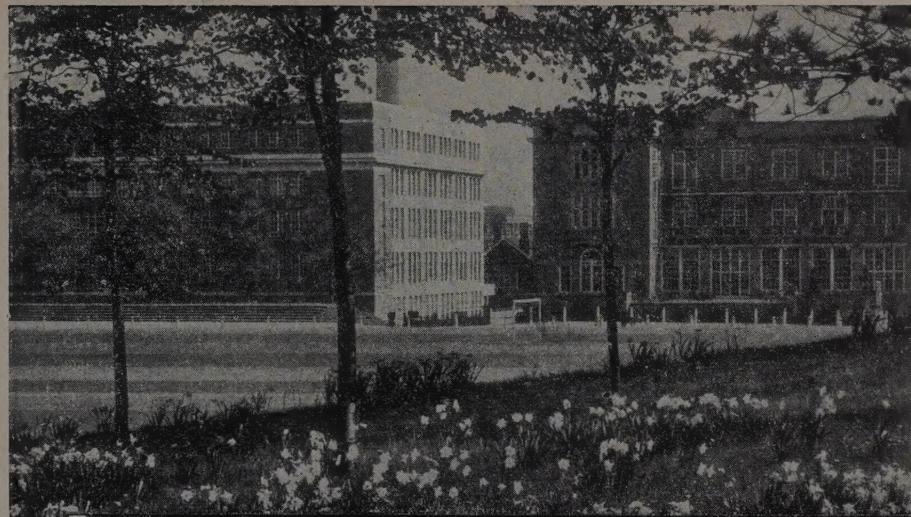


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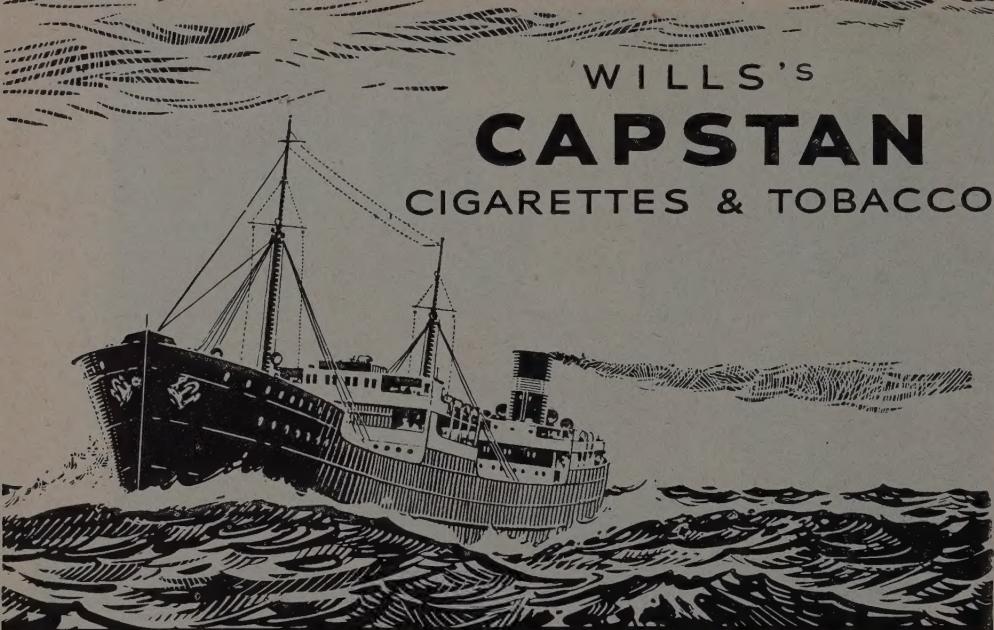
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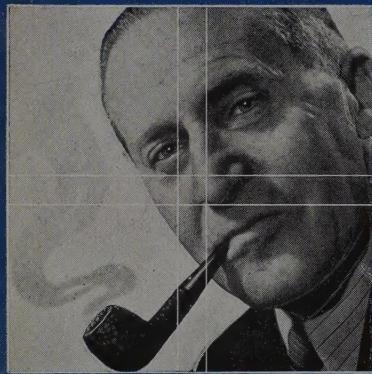
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